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ABSTRACT

The final report describes the generally successful development and use of two new instructional models for adult basic education (ABE): a peer instruction model and an instructional system for consumer decision making. Section 1 examines the two year application of the peer instruction model, first developed for the military, in various adult education programs throughout the country, including community centered adult education programs in Alabama and Vermont and adult school situations at the Compton Adult School, Compton, California, and the Memorial Adult School, San Diego. Background information, detailed local project reports, recommendations, and dissemination techniques are discussed. Section 2 examines the development of an instructional system for consumer decision making which incorporates consumer decision making and problem solving. Included are: background (discussing staff development and site visits), purpose (discussing educational objectives), design and development (including a prototype curriculum and field testing), and discussion of the application of the models to adult basic education situations. It was found that the two models were conceptually complementary, but dissemination mechanisms by which the ABE community could implement them were somewhat unsatisfactory. Various project related forms and comments are appended. (LH)

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# Staff Development Through the Implementation of Two Innovative Learning/Teaching Models

Peter Nabokov
J. Richard Suchman
Laurie Mandel
Martha DiSario
Hilton M. Bialek

HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street
Alexandria, Virginia 22314

March 1976

Prepared For:

US Office of Education
Division of Adult Education
Washington, D.C. 20202

Under Grant No. OEG-0-73-5221

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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## PREFACE

This document reports work performed under a grant (OEG-0-73-5221) from DHEW/Office of Education which began 1 July 1973 and ended 31 December 1974, with a grant extension through 31 December 1975.

Encompassed under the single grant were two essentially independent projects. They shared the goal of developing new instructional strategies for adult education but they evolved and were implemented quite separately. The report is organized to present each model independently. A concluding overview section will discuss their commonalities.

ACKNOWLEDGMENTS

This final report is divided into two major sections. Section I, describing the Peer-Instruction model, was written by Peter Nabokov, Hilton Bialek and Laurie Mandel. Section II, describing the Decision Making model, was written by Richard Suchman and Martha DiSario. Development and implementation of the respective models were conducted by the groups identified above. Hilton Bialek was the overall project director.

The group wishes to express their appreciation to the following individuals who, in particular, gave of their time and talent in helping implement the models:

Mr. Harlan Polsky and Ms. Sarah Duzen of the Compton Adult School, Compton, California

Mrs. Autumn Keltner and Mrs. June Walters of the San Diego Adult School, San Diego, California

Mr. Jack Fox, Monterey California

Ms. Liz Evans and Mr. Jerome King, Pima County Adult Education Program, Tucson, Arizona

Mr. Charles LaVerde, Salinas Adult School, Salinas, California

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SECTION I

CHAPTER I

# THE PEER INSTRUCTION MODEL

In this part of the project, the principle objective was to determine the extent to which a peer-instruction system, successfully conceptualized, engineered, and managed within an institutional (military) training context, could be applied to civilian adult-education. The idea was to search for the constraints of the model and to understand the process by which an innovation of this nature could be disseminated and implemented.

The report describes a number of both successful and unsuccessful applications. Problems of dissemination and implementation as experienced in this project are identified and discussed. Conclusions regarding the recommended usage of the model are presented. Included as a separate appendix is a dissemination manual.

## A. PEER INSTRUCTION AND HUMRRO

The notion of students teaching each other is not new. When an English Quaker named Joseph Lancaster opened a school for deprived children in 1798, the lack of available teachers forced him to conscript students to teach, a solution which proved so successful he wrote a book about it, "Improvements in Education". The observation that peer teaching was at least as beneficial to the student-teacher as to his peer was noted by Lancaster's contemporary, Andrew Bell, who wrote in 1832, "That

the teacher profits far more by teaching than the scholar does by learning is a maxim of antiquity, which all experience confirms - 'Docemur docendo' - 'He who teaches learns'."

In this century, Methodist missionaries applied the concept in their African village schools; throughout Latin America's peasant community education programs, the peer teaching approach was dubbed Cada Uno Ensene Uno, "Each One Teach One".

Some contemporary designers of instructional systems have rediscovered peer-instruction, though often starting out with different intentions and creating different applications of the peer teaching idea. Peter S. Rosenbaum of Teachers' College, for example, hit upon peer instruction during his search for an individualized feed-back system for shaping student progress in spelling units. Peers proved far superior to computers in providing that immediate, detailed feedback. His "peer-mediated instruction" system (Rosenbaum, 1973) calls for a tightly scripted peer/peer-teacher interaction. Grant Von Harrison of Brigham Young University had also trained peers to teach remedial reading at the middle school level. (His program was modified and adapted to ABE in the project being reported here. Details are presented below.)

In most peer-teaching efforts, however, what is actually meant is peer tutoring. This was the case with New York's Mobilization for Youth education experiments in the 1960's, where older children were paired with younger ones in a coaching twosome where the hoped-for benefits were as much social and psychological as educational, and as much for the older tutor as for his younger student.

Generally speaking, peer instruction utilizes a more advanced (usually older) student to tutor a less advanced student. The roles are fixed: the tutor remains a tutor and the learner does not go on to assume the teaching role. The HumRRO model was a marked departure from this.

In 1968, HumRRO became involved in the systematic exploration of viable alternatives to the traditional each-step method of training large numbers of heterogeneously capable people.

Earlier, in 1966, as part of then-Secretary of Defense Robert McNamara's "Project 100,000", designed to upgrade men previously rejected by the Army and make them eligible for military service, HumRRO's work unit SPECTRUM (1) began re-examining the Army's instructional strategies. Among its final recommendations was that a performance-oriented, individually-paced form of peer instruction might solve some of the Army's new training problems.

Out of these efforts emerged a set of instructional principles which would serve as guidelines in the development of training programs for the full range of the educational and aptitude spectrum. In brief, these principles were:

1. Performance-Based Instruction

The premise of this method of instruction is that the most effective learning occurs when the student becomes actively engaged in the process of learning. To bring the student to active participation, the purpose of instruction has to be thought of as equipping him with skills and capabilities. The subject-matter curriculum is inappropriate in this context, because it stresses what information and facts are to be presented to students to digest and memorize. Performance-based instruction translates the subject matter into the skills and capabilities that the student is to acquire as a result of instruction.

2. Absolute Criterion

When a student has learned to perform a skill, there must be some standard against which his performance is evaluated. For self-evident reasons, partial success in performance of a skill is unacceptable. Either a student knows how to perform a skill or he does not. Under performance-based instruction, the standard is absolute. When a student is unable to perform a skill, he receives additional training until such time as he demonstrates that he is proficient in that skill.

3. Functional Context

If the conditions for learning are arranged so that the student sees the usefulness of that instruction and can apply it in solving a problem and in relating technical information to application in a concrete

setting, that instruction takes place in a functional context. For example, learning in a functional context takes place when a student sees the effect of an abstract principle in a specific and actual situation, and when a particular skill is related to its utility in solving a real-life problem. Functional context refers to the application of technical and abstract information in a situation where the student can see its importance and relation to the skill he is learning.

4. Individualization

One of the main variables in learning is the amount of time allowed for a student to learn. Instruction that has an arbitrary time limit ignores the fact that students learn at different rates. Instruction that permits the student to learn at the rate necessary for him to acquire a skill is termed individualized instruction. The methods of individualized instruction should offer the student the opportunity to practice, repeat, and review the skill to the extent necessary for him to learn.

5. Feedback

When the student is actively engaged in learning a skill, he has to handle, and to practice with, the instructional materials. This situation has obvious advantages to the training manager, instructor, and student. All know how the student is learning, because there is ready evidence in the nature of the student's performance. All can easily assess where the student is having problems and where additional practice and instruction are necessary. This immediate knowledge of the results of instruction is called feedback.

6. Quality Control

A training system must have empirical evidence that the students have learned what was intended for them to learn. Through performance-based instruction, a training system has a direct means of verifying the quality of its instruction. Because students have learned skills, what they are able to do as a result of instruction is readily observable. Data on all students' performances can be gathered so that the strengths and weaknesses of the entire training system can be identified.

The search, then, was for an instructional strategy which would incorporate as many of these principles as possible and at the same time would minimize the disrupting effects of a large aptitude spread within a given group of trainees. The solution, as developed and put into operation in work unit APTSTRAT (2), was the HumRRO Peer-Instructional Model. As will be seen, the model is responsive to all six principles listed above. In addition, it is able to handle heterogenous training populations.

B. HOW THE HUMRRO PEER INSTRUCTION MODEL WORKS

The HumRRO version of peer-instruction turns the job of learning and teaching over to students, but it tries to insure that the quality of that learning does not deteriorate. The HumRRO system works like a relay race. One student teaches another how to do something; that second student turns around and teaches it to a third student, and so on. Students learn in succession rather than all at once.

What keeps all this student-teaching relevant and focused on the subject is a standardized check-out procedure between each transmission, administered by a third person, commonly the teacher. Each student must pass this check-out test 100% to prove that they have learned the task to pre-determined criteria specifications before he turns around and teaches it to someone else. Without this control the quality of the learning would certainly vary and probably fall apart. Everything the student must know is tested at this point. The student either performs the task correctly or does not. If failure occurs, the student and the peer instructor continue their work together until the test is finally passed. These pass/fail tests control quality, but do not discriminate between students on the basis of numerical grades. Their criteria insure that each student has learned the task and is qualified as a peer instructor.

In general, HumRRO has emphasized that these are actual performance tests, not paper and pencil (knowledge-recitation) questions about the tasks in question. The one-to-one nature of peer instruction provides the undivided attention which a classroom teacher finds hard to deliver, or which she turns over to programmed texts. It also allows the student to get rapid, precise information about how well he is learning while he is

in the act of learning. Since the HumRRO version of peer instruction stresses 100% mastery, accomodation must be made for differing learning and retention rates. So, within reasonable limits, students can take as long as needed to master the material.

The HumRRO model requires that the skills to be passed along the learning chain be broken down into a format that helps students clearly understand what they must learn to do. The mainstay of the HumRRO model is the "module". Modules are usually single-session teaching units, broken down from the larger instructional material. Modules are generally divided into two parts: Criteria, or the statements which make up the pass/fail performance test for that particular skill, and Steps, or teaching reminders to the peer instructor of crucial points and maneuvers to emphasize while instructing.

When the model is in operation, the teacher is cast in the new role of classroom manager. Her prime responsibilities now are maintaining quality control by administering the criteria tests, priming the system by teaching the first student of each learning chain, keeping the records of student progress through the modules, and constructively occupying students who are not engaged in peer instruction.

C. THE HUMRRO MODEL AND ADULT EDUCATION

Once work unit APSTRAT experience opened the door for HumRRO's engineering of peer instruction, consideration was given to exploring application of its model outside the military setting. Short-term, pilot implementation efforts of peer instruction were explored in:

1. Carmel, California (1970, River School, grades K through 5, modules in memorization of alphabet, dictionary usage)
2. River Rouge, Michigan (1971, High School, modules in food services, auto shop, carpentry, business education)
3. Pacific Grove, California (1972, High School, peer instruction as the delivery system for an office occupations program).

HumRRO's peer-instruction model entered the civilian adult education field with a project involving community education among the Penobscot and Passamaquoddy Indians of Maine. The 1972 Maine project applied the

HumRRO method of quality-controlled peer instruction to an Operation Mainstream training program on Indian Island, Maine, and to a mandatory training program for new homeowners participating in a Housing and Urban Development (HUD) program. Both HumRRO and local reports assessing this short-term project concurred that (1) Based on attendance and performance records, Indian students responded favorably to competency-based instruction. (2) When properly introduced to the model, students responded favorably to learning from peers. In fact, the competency-based instruction was so successful at Pleasant Point that 70 families learned their home maintenance modules through it and paid the entire cost of the training themselves; on post-training questionnaires, more than 70% of Passamaquoddy Indian participants requested more modules and the local Penobscot Housing Authority asked to employ peer instruction in its HUD home occupancy training project.

However, both developing curriculae and administering the peer instruction presented problems during the project. The preparation of competency-based modules suitable for peer instruction was not a skill which could be found locally; it required special training to break down skills into tight performance criteria, and rewrite those criteria after testing them out during "trial runs".

These incomplete but promising results of the brief Maine project encouraged HumRRO to further explore the applicability of peer instruction to adult education. Various handicap profiles of typical ABE students, such as those found in Curtis Ulmer's Teaching the Disadvantaged Adult (National Association for Public Continuing and Adult Education, 1969) and the California State Committee on ABE's Basic Education for Adults (1967), underscore the general ABE student's insecurity in the classroom, his overriding need to begin a series of successful well-defined learning experiences to counterbalance a history of dropping out of school, humiliation in the classroom, lack of personal satisfaction, and feelings of being lost amidst incomprehensible goals set by others. The feeling was that the HumRRO model might be ideally suited to overcoming these motivational problems because it is based upon providing the student with a series

of short, positive learning experiences where he watches his progress and confidence build module by module and where a public display of skill or knowledge was not necessary.

Such ABE student profiles also emphasize the erratic nature of the home/community life of many typical ABE students which is not conducive to regular attendance. The HumRRO peer instruction system, working as it does as a relay transmission system, can incorporate sporadic attendance through easily-mastered administrative adjustments - such as rosters where students schedule themselves to learn given instructional units (modules).

In addition, the HumRRO model's emphasis on personal interaction between peers in their own idiom or language as well as on self-paced, individualized instruction, seemed to offer relief to students intimidated by authority figures, and students who need a cooperative rather than a competitive atmosphere in which to strengthen their learning and retention capabilities.

Encouraged by the Maine project results, and theoretically matching these statements of typical ABE student needs with the positive features of its peer instruction model, HumRRO applied for and was awarded DHEW/ Office of Education Grant OEG-0-73-5221.

## CHAPTER II

## COMMUNITY CENTERED PEER INSTRUCTION

### A. INTRODUCTION

The Adult Peer project separates into two distinct stages. Initially, the written proposal as funded was premised on local, community control of administration and educational content. It was felt that local people on the scene in non-institutional roles - tribal spokesmen, neighborhood leaders, indigenous community organizers - were better qualified than imported experts to decide on the educational content of the peer instruction modules. At this time, the project was not only testing the viability of peer instruction as an instructional vehicle for adults, it was also testing whether knowledge and use of this model by local community personnel could lead to indigenous skill development without outside or institutional assistance.

A third objective was an exploration of the spectrum of curriculum content suitable for community peer instruction.

This first stage covered from July 1, 1973 to July 1, 1974. The second stage commenced with a mandated project redirection in late spring, 1974, and continued until December 30, 1975. The emphasis during the second stage shifted dramatically. The content area was assigned to be a loosely-defined constellation of tasks called "survival skills". The context was designated as traditional, preferably urban-minority, adult education classroom settings.

After hiring project staff, a "community criteria checklist" was devised to provide (1) a history of negotiation with each community where we were considering pilot testing of the peer instruction dissemination effort, and (2) a means to measure and compare the degree to which communities met and pre-established criteria of acceptablility (see Appendix A).

By October 31, 1973, project staff had contacted twenty different referral sources in search of leads to community groups around the country with viable leadership, serious community education goals, and good grasp of their responsibilities in the kind of innovative research and development being proposed. Twenty-eight community groups were subsequently contacted by mail and via extensive phone calls. Seventeen communities and organizations were then actually visited by staff members for in-depth discussions to further prepare for final site selection. From nine communities anxious to participate, the Vermont Community College and the Alabama Council for Human Relations were chosen and HumRRO representatives Peter Nabokov and Laurie Mandel were on location in late fall.

B. COMMUNITY PROJECT SUMMARIES

Alabama: HumRRO representative Laurie Mandel worked with all-black, all-women Auburn Household Technicians (AHT), a cooperative established by the Alabama Council for Human Relations to improve the employment conditions of Lee County's household workers. Functioning primarily as an employment agency for household workers, AHT required that its members undergo training in home management and first aid before being elibible

for job placement. After some community surveys, the first aid course was selected for conversion into peer instruction because of high attrition and high failure.

With the accredited local Red Cross first aid instructor as content expert, eight modules were prepared: (1) broken bones, (2) bleeding, (3) artificial respiration, (4) burns, (5) heat exhaustion, (6) poisoning, (7) insect bites, (8) animal bites. Initially dubious about non-professionals teaching the life-and-death first aid skills, the Red Cross instructor became enthusiastic as he watched the modules' performance-oriented condensation and exactitude take form.

After two months, twenty women had been enrolled, twelve had completed all modules. Actual learning time per student for the eight modules was an average of six hours, for each skill about twenty-five minutes. The authorized Basic First Aid course, which contained approximately fifteen skills, took about fifteen to eighteen hours to complete and did not guarantee 100% mastery. In the previous year, twenty-four women had enrolled in the course and one finished. This may have been largely the result of the course's heavy emphasis on reading. More significantly, once the instructor had "primed" all the modules, thus starting the peer instruction chains, all the learning and teaching had been conducted by the students themselves. The Red Cross instructor stated that it was the first time in his five years of experience of first aid teaching that he actually knew what his students had learned and what they were able to actually do upon completion of the course. He urged HumRRO to contact the National Red Cross in Washington to discuss preparing a version of the Red Cross first aid manual based on peer instruction modules. Once this contact was made, we were informed that the National Red Cross was about to distribute a new multimedia (audio-visual) program and was not interested in our results. Two months later, the training was still enrolling new students and graduating old ones. Course management was entirely in the hands of the local coordinator.

A second effort in Alabama involved home maintenance training conducted by the East Alabama Cooperative Housing, Inc. (EACH), a self-help corporation assisting low-income Lee County families in building their own homes.

Out of EACH's repair skills list and interviews between the HumRRO representative and the local VISTA volunteer, six instructional modules were chosen to be taught through peer instruction: (1) screen replacement, (2) repairing the hot water heater, (3) electrical repairs, (4) repairing the commode, (5) fixing faucet leaks, and (6) unclogging sinks and drains. The Adult Peer "redirection" halted efforts to obtain follow-through data on the project, but at last word, a "trial run" of three weeks indicated that the modules were being well received. Sessions were taking place in the participants' homes. Upon completion of the course, homeowners began receiving certificates and basic tool kits.

Vermont: HumRRO representative Peter Nabokov worked with the Community College of Vermont (CCV), an alternative adult education organization established in the early 1970s to serve the low-income, rural adult population throughout the state. The agreement between HumRRO and CCV earmarked the northernmost of CCV's three regions as the initial site for implementation of peer instruction, an area known as the Northeast Kingdom. CCV's non-campus, community-responsive and performance-based curriculum was divided into tri-semesters. It was projected to make the Spring 1974 semester an opportunity for staff acquisition of peer-teaching techniques, training in preparing modular materials in both try-out content and actual instructional content for the summer courses, run "trial runs" with volunteer students to revise modules and overcome scheduling problems, and prepare for full summer/fall operation and consequent evaluation and data collection. Due to the project's redirection and severe administrative problems within CCV itself, only the training phase was completed.

Two peer instruction training sites were established: the Lyndonville and Newport field offices of the Northeast Kingdom CCV region. In addition, a CCV staffer representing the Montpelier central office was assigned to participate for future CCV staff development purposes. In all, four field and central office personnel received intensive training in all aspects of peer instruction from December 1973 through mid-March 1974 and developed module series in Basic Sewing, Basic Photography, Basic Crewel Embroidery, and Weaving. The Basic Photography course was fully pretested during trial runs and implemented in a regular class.

In addition, peer instruction workshops with state-wide CCV personnel were held at which two Vermont ABE staffers were also present. This led to discussions exploring the use of peer instruction in Vermont's ABE program, primarily in the areas of literacy and metric education. Prior to his departure, Mr. Nabokov worked out a spring phasing schedule in preparation for the four summer courses CCV had obligated itself to operationalize through peer instruction: Business Machines, Accounting, Basic Auto Repair, Welding. To support CCV's preparation for these courses, Mr. Nabokov prepared a Peer Instruction Implementation Pamphlet for use in his absence. However, CCV's administrative problems and staff cut-back made them drop their pledge, ending the hope for obtaining further data.

C. OBSERVATIONS AND COMMENTS

1. A primary lesson of this stage was the necessity for clear-cut initial contractual agreements between HumRRO and the cooperating agencies in its projects. Lack of working guidelines detailing mutual responsibilities dogged the Vermont episode and to a lesser degree the Alabama project. For the following stage this lesson was incorporated into a "letter of agreement" spelling out the obligations of both parties in a real-world research and development special experimental project such as the peer instruction implementation effort.

2. Stage one did not significantly advance the "state of the art" so far as peer instruction content was concerned. The skill training which was converted into a peer instruction format were all psycho-motor skills involving hands-on, manipulative tasks; it was already expected that these would be easily adapted to peer instruction. If the Vermont project had evolved to develop ABE modules in literacy and metric education, the spectrum of skills known to lend themselves to peer instruction might have broadened.

3. The "back-up" problem unique to peer instruction - what to do with students not yet in a learning "chain", or finished with the peer instruction while their classmates are still teaching each other - was not adequately solved. In the Vermont Basic Photography course, students simply returned to a small pool of students working informally with an

instructor. In Alabama, the first aid students had many modules to learn so they moved from one module to another; when a student had completed them all, she generally helped coach a teaching/learning pair. But it would remain for Stage Two of the project to confront this problem more directly.

4. As to the ability of local staff people to prepare hard performance criteria, there was a marked contrast between the Alabama and Vermont sites. In Vermont, personnel could be found with sufficient background in deriving comprehensive, tightly-written, performance criteria for given skills; in Alabama, such individuals were hard to locate and most of that work fell to the HumRRO representative. The importability of the model seemed limited, therefore, as far as the material-preparation function was concerned; this was the same problem that had arisen during the pilot effort in Maine.

5. Finally, there was the matter of continuity of local personnel and stability of the cooperating agency which was offering HumRRO the real-world implementation try-out. With distressing regularity it seemed that individuals who had been the assigned recipient of the peer instruction training were re-assigned, transferred to other functions, or a policy shift would give the project a new content focus. New people would have to be trained, new content areas agreed upon, and valuable time was invariably lost.

6. In conclusion:

a. Under the proper design and management conditions, adults in community settings do learn easily through peer instruction and find it a preferred and enjoyable experience.

b. It is unreasonable to expect to teach community members the skills of module design and development. Therefore, it is unlikely that the system would survive once the initial modules provided by the developer were learned.

c. Few communities seeking help in improving conditions can specify what skills are needed that would make a difference.

d. Given the limitations just mentioned, in a community setting the peer instruction model is the system of choice where:

(1) the number of learners that can be assembled together on a more or less regular basis exceeds ten
(2) the skill to be learned involved six or more modules
(3) the learners are from a generally non-academic, minimal reading population

## CHAPTER III

## ADULT SCHOOL CENTERED PEER INSTRUCTION

### A. INTRODUCTION

In May, 1974, Adult Peer Project Director, Hilton M. Bialek, Ph.D. met in Washington, D.C. with Mr. Paul Delker, Director, Division of Adult Education, and members of his staff to discuss future plans. Agreements reached were: (1) to shift focus from indigenous communities to established urban Adult Education centers. Efforts at community sites would be supported as needed for remainder of year (until July 1, 1974), then full effort would be directed to establishing a working relationship with two such centers, (2) to revise the conceptual structure of the project so that the two existing parts (see accompanying report on Staff Development Institute for Leaders in Adult Education and the Decision-Making Model) be combined into a single effort, (3) to focus on establishing two fully operational programs so as to be able to observe effects on adult learners, (4) to focus on teaching of survival skills, (5) the Division of Adult Education would provide liaison between HumRRO and potential Adult Education Centers in order to locate appropriate sites, (6) Division of Adult Education to arrange coordination between HumRRO and University of Texas APL Project to expedite definition and selection of "survival skills". Unfortunately, because of severe staffing shortages, the Division of Adult Education was unable to provide the significant support promised in points (5) and (6).

Of the site visits to five Adult Education centers in California who responded to a letter of inquiry sent to ten Adult Education schools,

education administrators in Compton, California and San Diego, California seemed to respond with the greatest interest in and understanding of HumRRO's research and development needs for the Adult-Peer project. After auditing both programs, and subsequent correspondence, these sites were officially selected.

In an attempt to establish a firm commitment from the selected sites to support the project, a formal "contract" was submitted. Each site was requested to have this document formally approved by an appropriate administrative body. (See ppendix B for a copy of the agreement.) This did help. As a matter of fact, because of the total turnover in administrative and teaching staff at San Diego, it was necessary to resurrect this "contract" in order to insure support for the final duration of the project.

B. PROJECT NARRATIVES

1. Compton, California: The year-and-a-half Compton effort divided into three successive phases: (a) "Survival Skills" (b) Comprehensive Employment Training Act (c) ABE measurement modules.

a. Survival Skills and Training of Compton Personnel
Mid-August - December, 1974

Compton Adult School Curriculum Developer, Ms. Sara Duzen, working with HumRRO representative Peter Nabokov, became trained in all aspects of the peer instruction model. A survey form was designed to provide a localized, specific reading on the "survival skill" needs relevant to major ethnic sectors of the Compton community. It was based, in part, on the ten highest ranking of the forty-five APL task modules in Occupational Knowledge, the ten highest ranking of the eighty-four APL task modules in Consumer Economics, the ten highest of the forty-two APL task modules in Health, the ten highest ranking of the twenty-one APL task modules in Community Resources, the ten highest ranking of the thirty task modules in Government and Law, and the ten highest ranking of the fifty-two APL task modules in Transportation.

In addition, a realistic project phasing schedule was prepared. Teachers were briefed on the project in anticipation of classroom selection. An all-day in-house peer instruction workshop was held September 19, 1974 for

other Compton administrative personnel. A peer instruction reference notebook was prepared for the Compton site, and arrangements were made to exchange training information and modules with the San Diego site.

Wide ranging community interviews with Compton spokespeople - Human Resources Development Agency, Dept. of Rehabilitation, Sickle Cell Clinic, Welfare Case Workers, Welfare Rights Organization, Mexican-American Community Center, etc. - were conducted to develop a relevant survival skills "menu" from which students could choose skills to learn. To explore the "survival skill" of form-filling, an eight-page peer instruction module was drafted for completing the Application for Veteran's Benefits as well as the Social Security Benefits form. Income tax computation was also converted into a peer instruction format - although later evaluation showed this to be impractical. The hope was to develop some single module units to drop into Basic Skills classes concentrating on literacy and computation. Discussions were also held to use peer instruction in ESL classes held in a local industrial firm hiring Mexican-American laborers where management had given release time for in-factory language classes. All these efforts were an attempt to identify functional, relevant skills.

b. Comprehensive Employment Training Act

January - August, 1975

Although HumRRO had been training Compton Adult School personnel in applying peer instruction to the "survival skill" area, in February, the Compton Adult School won a CETA grant for training students in office occupations. Compton school administrators made the decision that peer instruction potentially seemed an ideal delivery system for the Work Experience component of this new CETA project. As CETA's overriding goal is student employability, this was considered a highly pragmatic "survival skill" and a proper test of the usefulness of peer teaching as well as a prime opportunity for Compton personnel to practice applying peer instruction to the kind of unexpected training needs and opportunities that frequently arise within adult education programs.

Following lengthy coordination and planning among Office Occupations instructors, Compton Adult School administrative and curriculum development personnel, a study-and-work experience schedule was initiated for the incoming CETA students. Twenty pre-tested and interviewed CETA students would be paid $2.50 an hour for a six-hour day divided into class work in the morning, and on-the-job experience at work stations located in the public sector in the afternoons. The student's progress through the work stations would be pre-arranged so as to reflect the growing complexity in the hierarchy of office skills for which students were being trained in their daily morning exercises. Students would teach each other the work station tasks through the HumRRO model of quality-controlled peer instruction.

Each job station would contain one or more peer instruction modules which presented clear performance objectives for each student entering the station. Thus, the work station concept was now envisioned as a quality controlled, structured, on-the-job training experience instead of the unstructured and largely unsupervised "extra help" situation it has traditionally been. When students learned the module(s) in a work station from another student, and correctly demonstrated mastery, they turned around and taught the station's modules to a new student coming in. Then they returned to the classroom for an interval of full-time work to allow for job interviews and counseling appointments; then they went on to a more difficult work station in the hierarchy of work stations.

Five peer instruction modules were initially developed for four work stations. The names of the modules, the number of students involved and learning times are shown in Figure 1. They were initiated on four separate dates ranging from March 10 through April 28. Three of the work stations had one peer instruction module per station. The most complex module, the processing of GED forms in the working office at the Compton Adult School, at first took an average of two weeks for students to learn and two for them to teach.

Figure 1: Compton Office Education Modules

OFFICE EDUCATION

Total number of students: 35

| Module | No. Students | Learning Time | Module in Operation |
|---|---|---|---|
| G.E.D. | 22 | 27 hrs* - 5 hrs** | 3/10/75 to 12/15/75 |
| Filing | 18 | 14 - 5 | 4/28/75 to 12/15/75 |
| Master Files | 13 | 17 - 5 | 3/10/75 to 10/07/75 |
| Phone | 13 | 15 - 5 | 3/17/75 to 10/07/75 |
| Employment Applications | 12 | 15 - 2½ | 4/02/75 to 10/02/75 |

*Average learning time of first three students in the sequence.
**Average learning time of the last three students.

Work Station I, located at the Compton Adult School Veteran's Counselor's office was begun March 10. By July 3, peer teaching had engaged seven students in a total of 159 learning hours and 129 teaching hours. There was also a gradual drop in the amount of time it took the first student to learn the GED form processing task of this station - thirty hours - to the time it took the last student to learn the same task - seventeen hours.

Work Station II, located at the Compton Neighborhood Services Center, composed of the Master File module and the Phone Reception module, also opened March 10. By July 7, seven students had devoted a total of 190 learning hours and 115 teaching hours to these two tasks.

Work Station III, the correct filling of client employment applications, was also located at the Compton Neighborhood Services Center. The seven students who went through this module between April 2 and June 17 showed a total of 105 learning hours and eighty teaching hours. Along with Work Station II, the learning time significantly diminished as the oral peer teaching chain grew more facile in communicating the basic elements of the task.

Work Station IV, situated in the front receiving wing of the Compton Adult Center, showed five students completing the module between April 28 and June 30, performing for seventy-one learning hours and fifty-six teaching hours.

Analysis: It is important to remember that this training was going on at actual, functioning offices. The advantages of this real-world setting for the trainee and for training effectiveness are well known, but there are innumerable drawbacks for the evaluator. The job incumbents are neither trained to collect data, have little time to do so, and in the main, were not too interested in or appreciative of the need for it. Students were asked to keep records of their own teaching and learning time, but it was not possible to have a third party data collector at each site. In an interim progress report dated July, 1975, the Compton Curriculum Developer reported:

> *"There was great difficulty in getting the students to record the date they began the station and the criteria test date. The job supervisor kept an identical log, but she also let it slip, and sometimes filled it in from memory. In some cases, a comparison of both time logs was inadequate, and dates had to be estimated. Therefore, it was impossible to get a daily log of attendance. The figures do not include holidays, but they do not accurately reflect all student absences... One job supervisor commented that she was getting tired of keeping track of things... The performance figures are estimated. They are of little interest to the project, since this time was not restricted to the specific tasks defined in the peer instruction modules. Students performed other services part of this time. At the filing work station, the registration cards used with the module were occasionally withheld during the performance period to insure a sufficient supply for the next learning period."*

Efforts to tighten control over data collection were only moderately successful. It must be kept in mind that these agencies had made no commitment with HumRRO to extend service and support. Nevertheless, trainees clearly learned the required skills through peer instruction while simultaneously receiving valuable work experience. The subjective reactions reported below from both students, job incumbents and staff, seem to reveal strong support for use of this peer instruction for these skills and in an on-the-job-setting. Note also the appreciable drop in training time across all five modules as the system continues; from an average of seventeen hours to four hours per module.

c. ABE Measurement Modules

August - December, 1975

With the CETA project successfully employing peer instruction, attention turned to introducing peer instruction into regular day-and-night ABE classes. An all-day hands-on peer instruction workshop was held September 16 with seven instructors who duties either directly related to ABE students or were involved in preparing curriculum for those students; all had evidenced interest in participating in this final phase. Three of the instructors volunteered to introduce peer instruction modules into their classes. With instructor consultation on content, Curriculum Developer, Sara Duzen prepared the Measurement Series, a sequence of short modules which carried the student from the basic exercise of Bisecting a Line through a series in learning to read the ruler. Two instructors used the modules in their classes. Figure 2 presents the modules, number of students, and training time for the ABE classes.

Figure 2:

ADULT BASIC EDUCATION (ABE)

Total number of students: 29

Section I: B. Smith - Elementary Subjects - Total 18

| Module | No. Students | Learning Time | Module in Operation |
|---|---|---|---|
| Bisecting a Line | 13 | 15 min. average | 10/02/75 to 10/07/75 |
| Geometric Shapes | 3 | 7 " " | 10/06/75 to 10/02/75 |
| Intro. to Fractions | 3 | 20 " " | 10/09/75 |
| Ruler 1 | 13 | 10 " " | 10/16/75 to 10/22/75 |
| Ruler 2 | 3 | 10 " " | 10/22/75 |
| Ruler 3 | | | |
| Ruler 4 | (teacher absent with illness) | | |

Section II: C. Brumfield - Elementary Subjects - Total 11

| Module | No. Students | Learning Time | Module in Operation |
|---|---|---|---|
| Ruler 1 | 11 | 10 min. average | 11/24/75 to 11/26/75 |
| Ruler 2 | 4 | 10 " " | 11/26/75 (in process) |
| Ruler 3 | (in process) | | |
| Ruler 4 | | | |

Analysis: ABE Elementary Subjects

The content, basic measurement, was selected by the participating instructors and adopted from existing instructional materials. Presumably students "wanted" to learn these skills because they were enrolled in an ABE program. The curriculum coordinator was able to observe the start of the system for its first seven days (after the modules had been developed) and the following somewhat detailed excerpts from her log are presented in order to fully convey the strengths and weaknesses of the model to this group and with this content:

*10/3/75 SECOND DAY--Bisecting*

*I reprimed the chain by teaching the aide, Mr. L. -- very tense and precise person. He taught student #2. Student*

2 couldn't teach student 3. L. taught student 3 easily. Student 2, it seems, according to L., could learn but couldn't teach.

10/6/75 THIRD DAY--Geometric Shapes

...The teacher still has not freed herself to attend to the process of peer instruction. Unwilling to stop and adequately administer test. Day very hectic and disorganized. Wall chart OK. Difficulty keeping track of learning time and date using the small pink slips. I am reminding everyone of slips (we chose not to show their learning time on the chart for everyone to view).

Low level student who failed to Bisect a line was allowed to learn geometric shapes. The decision was made in order to support the spontaneity that occurred as follows: the second (and last for the day) student was told she would have to wait until the next day to teach. She was not satisfied with that--found student 3 and insisted on teaching her--I said fine.

At this point the teacher agreed to free herself to supervise, beginning with the next day's activities. She was encouraged to assign her two aides to the regular class activities and to supervise aides, not students, and peer instruction. This may seem a bit past due at this point, but it took three classroom days to make her see the necessity even though she had verbally agreed to do so before the start. She was convinced when she realized she could have prevented this incident: L., the aide, had chosen to include a student in the chain who was too advanced. The student was insulted and very outwardly showed his contempt. He was a poor teacher because of his attitude. The teacher then realized her options--she could have decided to include him by

personally "bringing him along"--explaining that he could skip the module or just take the test and then teach. I apologized to the student at lunch and thanked him for participating--he was pleased. (He came in eager the next day.)

10/7/75 FOURTH DAY

Teacher noticeably in charge. Chose to do Bisecting only--catch up with students who were previously absent. Peer instruction running more smoothly--all activities running better. Aides are "floating". 19 students.

Need another TIP for Bisecting: One student changed the compass arch between first and second archs. She was sent back to her student-teacher--still could not perform. There was personal animosity between them. The teacher finally corrected the compass error. Those who can read have not bothered to do so. Focus is on compass and ruler. The formal module is ignored. Therefore, the TIPS should be on a separate sheet in large print.

Meeting at end of day: Teacher, myself, two aides. Quick review of the purpose of peer instruction, learning benefits, possible difficulties. Requested comments from all. Meeting was necessary as a formality to include the second aide who had inadvertently been omitted from previous contact with the process. (Occasionally absent, I was even unaware of her at first.)

10/8/75 FIFTH DAY still Bisecting

Learning time is not decreasing--varies from fifteen minutes to a half hour, depending on verbal ability or manual dexterity. Some cannot use the compass. A student who has the ability to use the compass does not

*seem to be learning if his teacher cannot. He gets stuck with his teacher's awkward method.*

*I keep intercepting to remind students to go over the TIPS, or to suggest that students say what they have learned before testing. These are people of FEW WORDS.*

*(other classroom goings-on: one student is asleep--was reminded to rest at night so he might stay awake--then left to sleep. One female student has her pre-schooler here--they are outdoors in the sun--friend joined her--both doing little with child disturbing. 18 students. ...Random assigned tutoring works well)*

*Summary after 5 days:*

*Module I:*

*Bisecting a line has proved to be too difficult. Some students cannot handle the compass at all. Arthritis and underdeveloped or inadequate fine motor skills are interfering. Some have been able to learn the skill but have been unable to communicate the five main points they have learned. This communication seems to be a more refined skill than that of bisecting a line (assuming the ability to manipulate the compass). The written material has helped very little.*

*However, most students have enjoyed the first module: Only one asked to be excused from teaching. Module still in progress with our prompting and interceding*

*10/9/75 SIXTH DAY Fractions*

*...To date I have not totally hovered over each pair of students. Today I decided to hear every word. (I later realized she had again chosen a bright student to teach and then gave that student a dull one.) Here is the chain exactly as I recorded it:*

30

*Student 1, C.A., - three minutes, prior learning, eager very patient teacher, made suggestions to me about material.*
*Student 2, S.W.,-twenty-five minutes, no prior learning. Confusion between shaded and unshaded parts. Materials had to be marked to ask "What fraction is the shaded part?" Teacher primed first student (with too much information) by teaching both shaded and unshaded parts--stressed "taking away" the shaded part by covering the shaded part with her thumb. This left the unshaded parts and started the confusion. Student one quickly made the distinction, but when he taught, he repeated the action, mimicking the teacher. His student, S.W., struggled with the problem even through her teaching role.*
*Student 3, A., - non-reader--the one who was excused from teaching "bisecting". I should have intercepted, but assumed the teacher had a plan--it turns out she just forgot. A. learned very shakily (never attended school before, very frightened). Did not teach. Teacher apparently never intended for her to teach. I could not find out why she (or S.W.) had been included in the chain.*

*At this point I insisted on closer selection of students.*
*C.A. (student 1) taught again. Did well, enjoying experience.*
*Student 4, M.T., seems to be the right level. No prior experience, but has capacity. Passed test, but very shakily.*

*The interaction has boiled down to a picture-exercise of:*

1. *What is the top number? ...the number of shaded parts.*
2. *What is the bottom number? ...the total number of parts.*

*NO OTHER COMPREHENSION IS BEING PASSED ON. Students memorize: A fraction is a part of something. But it means little.*

10/10/75 SEVENTH DAY fractions continued

Next student in chain to teach is absent (M.). No others present who are at the correct level. No peer instruction today. Discussed progress to date with teacher. She feels that not many students will participate in the three fractions modules. She wants all to do the ruler modules (3) except the very low students.

Teacher requested the ruler modules at the workshop. It was our decision to try the other modules in her class. Therefore, I am not disappointed that there aren't more students to do the fraction exercises. It has given me an opportunity to give them a trial run before trying them in the night class which is not as accessible. Students either can't learn fractions, like S.W. and A., or they have had a little work in them already. A few will learn, a few will review. So we will have some students trying the material.

However, I anticipate all of the same difficulties when we get to the night class with Mrs. Brumfield, who requested the fractions material. Here are the difficulties as I see them:

from the students' point of view:

1. Variety of student levels of learning (various grade levels).
2. Variety of mental and emotional handicaps affect the <u>way</u> they need to learn (even if they were at the same level).
3. Absenteeism is high (higher below fourth grade level than above fourth).

from the teachers' point of view:

1. few or no lesson plans surrounding peer instruction
   a. hence, the management plan for peer instruction however simplified, is not only an imposition,

*the teacher seems not to have the "inner organization" to chart and systematize, or at least not the habit of doing so.*

*b. Hence, there are many demands on teacher's time while managing peer instruction to also manage the class by the "brush-fire" method. (Comment: "brush-fire" may be the only workable for any but the bright-star teachers.*

*2. Students want personal attention from the teacher, much like a toddler demands from his mother. (I spoke to the teacher for fifteen minutes. One student walked up to her, handed her a test, and banged his pencil on the desk angrily.)*

*POSITIVE ASPECTS:*

*These students desperately need variety in learning. They have enjoyed peer instruction (it has not truly functioned as peer instruction yet). The few who have been successful learners have been eager teachers--glad to teach again and again. The thrill of accomplishment and the pride in responsibility are apparent. C.A. couldn't resist hovering over his students while they tested--he was very interested in their success.*

The above excerpts reflect the difficulties in implementing a peer instruction system in ABE (the log does convey the informal distracting, sometimes inchoate atmosphere of a typical ABE classroom). Teachers need a great deal of support, encouragement and training. They cannot be expected to develop their own materials; they seem reluctant to take on the managerial, organizer role required by the system. For many students, on the other hand, having to grasp conceptual units (i.e. "fractions") in order to be able to teach them is more than they seem able to manage. This does suggest that under other instructional arrangements such students are going through the motions of workbook or programmed exercises with little mastery or comprehension.

In conclusion, the peer instruction system did not seem to provide any great advantage for this class as contrasted to its effectiveness in the office-education project. However, another ABE class, an evening session managed by a stronger, more secure instructor, enthusiastically carried through the fraction and ruler modules and, at date of project completion, were asking for more. In addition, this instructor experienced no severe managerial problems with the peer instruction method.

c. Observations and Comments

The following comments are excerpted from evaluations prepared by the Compton Adult School administrative personnel most intimately connected with the peer instruction project.

General Reactions to Peer Instruction:

*"...Our experience with HumRRO and the peer instruction module has been a most unique and worthwhile experience. We have learned many things about ourselves and about instructional methods for adults.*

*It would appear that peer instruction is another tool in the repertoire of the teacher in helping the student learn. That tool has specific uses, and it, also, has some specific drawbacks.*

*We now have a trained person on our staff, which gives us the capacity of teaching peer instruction to other members of the staff...*

*...Let me say in closing, that it has been a successful project,..."*

Harlan L. Polsky, Principal

*"The Peer Instruction Model is successful with psychomotor skills or cognitive skills combined with tasks. Pure cognitive or affective learning should be steered by other means.*

*Peer instruction had two successes in Compton. In one instance the module writers took total responsibility for the curriculum (work stations). The other success took place in an elementary subjects classroom where the teacher knew and taught her course of study so well that she could write it from memory. Peer instruction must take place within an organized set of materials, or peer instruction must provide that organization of the materials...*

*...The eighteen-month project in peer instruction has taught us much about ourselves and adult education in general. Perhaps the investment of time came too soon for optimal use of the experience, and perhaps it was a valuable, preparatory experience for curriculum revision in the years ahead. Although we discovered many improvements in instruction and staff which must be made in order for peer instruction to succeed in Compton, our willingness to embark on such a project proved to be an initial move toward those improvements..."*

Sara Duzen, Curriculum Developer

*"It has been a productive year - we learned a lot about how to and how not to administer a peer instruction system. The constraints of JOB PLACEMENT did not help our implementation of the module, however, students, teachers and administrators alike feel it offers decided advantages over conventional instruction. I would think that with additional funding we will expand our program during the coming year. It was a very worthwhile application of the peer instruction model, and one that should be investigated during the coming years with an eye toward working out some of the very minor problems we experienced."*

William Deutsh, CETA Program Director

Student Response to Peer Instruction

*"There are no special motivation requirements. Students of all ages and backgrounds respond positively to peer instruction. The model increases in effectiveness proportionately with the communications skills of the students. Difficulties in the teaching chain might occur at the EMR level of intelligence. Students at or approaching this level learn diligently but make poor teachers, poor communicators of information, and they are slow to grasp and enjoy the overall rhythm of changing roles. Much more teacher dedication and time would be required for low-level students. Average (or above) students make visibly true every positive forecast of peer instruction. For isolated tasks, such students seem to be more superior vessels of information than are teachers."*

Sara Duzen, Curriculum Developer

*"The majority of student comments I heard about were all of a positive nature. ALL students seemed to identify with a fellow student doing the teaching function. There were many-many positive comments from the students regarding the function of one student teaching another. Appropriate levels of instruction, non-threat situation, fun to learn and exciting, were but a few of the comments heard from the students. Any system that can turn students on to that degree offers a great advantage over the conventional systems."*

William Deutsh, CETA Program Director

(See Appendix C for unsolicited comments from three CETA students.)

Personnel Requirements of the HumRRO Peer Instruction Model

*"Module-writing is a specific skill, taken for granted by some and impossible for others. Teachers who are accustomed to developing their own courses, writing their own materials, improving their classroom management plans, and writing behavioral objectives would make good module writers. The*

*writer must have the patience and skill needed to analyze a task and accurately define the criteria for determining whether a task is done correctly. A non-teaching person with such skills can write the modules, but the inefficiency of transferring the information from the teacher (expert) to the module writer makes such an arrangement costly. Furthermore, it is unlikely that one would find a teacher who is sufficiently motivated to try peer instruction and make it work successfully, but who does not have time to personally develop and adjust the materials while they are being tried. A truly interested teacher would want to control the module writing and regularly improve the material with use. A classroom teacher, as the module writer, would probably construct teaching tips by referring to resources already in use, using peer instruction as the delivery system; there would be no lag between expert and writer.*

*The person who writes the modules is the one with a vested interest in the outcome. Therefore, once a support person has been trained to write peer modules, that person should be used to train interested teachers to write modules. A formal agreement should be made with those teachers to pay them a limited number of hours for their initial efforts (an undefined agreement might not end)...*

*Success can be predicted for peer instruction where success already exists. Peer instruction alone is not likely to reverse negative classroom trends.*

*The teacher must be a competent educator. The model functions successfully when run by an organized, confident, dedicated teacher. An experienced K - 12 teacher who is accustomed to keeping records and student profiles might consider the model to be helpful and easy to manage. A weak, disorganized teacher definitely finds peer instruction to be an imposition and a threat...*

*...if the decision to try the peer instruction model is made by management personnel, there are other considerations. Are there clear, functioning lines of authority in the school? Is there a certificated resource teacher or department chairperson who has authorized time and designated authority? Does the school have efficient systems for gathering data (is there efficient organization surrounding the classroom environment)? Is there clerical time? The usual growing pains of innovation should be anticipated.*

*Peer instruction is demanding in the way that behavioral objectives are demanding. The writing of behavioral objectives is first seen as a bothersome task--a sort of manipulation of words that must be learned in order for teacher, administrator, and state to communicate using the latest fad terminology. Then the challenging aspect of actually predicting student outcomes is experienced with confining resentment. Only the most competent, secure teachers emerge from the experience able to teach specific objectives while at the same time utilizing the teachable moment to produce outcomes which words can never describe. Compton's experience with peer instruction has produced concrete skills in defining learning outcomes."*

Sara Duzen, Curriculum Developer

*"Adult Education, in order to meet community needs, must be flexible and, therefore, to some degree administered on-a-not-too-rigid basis. One of the items that is necessary in peer instruction, to have it operate successfully, is a certain amount of rigidity within the classroom structure, which must be provided by the teacher who is willing to teach in that manner. It is difficult to have teachers incorporate certain items that are rather rigid into their teaching program, unless they have had the familiarity with rigid systems..."*

Harlan L. Polsky, Principal

Peer Instruction and the CETA Program

*"Presently, we have four work stations which are taught by peer instruction and two work stations which do not have modules. The chief advantage of peer instruction is the inner confidence it builds within a student to learn a particular skill to the extent of teaching that skill to another student. This also enhances the student's skill in communication. In comparing those work stations without modules, it has been found that the students do a variety of clerical jobs with no particular goal in mind; other than to complete an assignment. Those stations with modules give the students an immediate check as to whether the job has been completed correctly.*

*The one disadvantage of the peer instruction system is that it does place a restriction on those students who can be considered for possible employment. There is a break in the system if students who are job ready and are in a teaching role are permitted to be sent on job interviews. Initially, we did have some problems with this restriction; however, with the assistance of our Job Placement Office, our job placements have been excellent. Once we placed our CETA Program goals in priority order, everything seemed to have fallen into place--those students who were employable, have been employed and our program has grown.*

*I think before the peer instruction could be expanded to our total office occupations program, we would need to have a supervising teacher who could handle this kind of program on a full-time basis. It could be very beneficial to those students who were competent and ready for practical clerical application; however, keeping track of approximately fifty students on various work stations would be a full-time*

*responsibility. As far as classroom instruction, those students who are advanced do assist the instructors in working with students who have a lesser degree of competency."*

Mary H. Williams, Chairman
Business Education

*"Should we receive CETA funding for the coming year we will be establishing a number of peer instruction modules for a variety of work stations...*

*...We must have trained module writers. We must know how much it will cost us to develop a module. And we must know how many dollars we have to operate with. Once these variables are defined, and assuming that we have the money to invest within the program, I can visualize many courses being designed for peer instruction...*

*I would assume that we will expand our work stations within our Multiclerical program and add additional stations within Food Service plus any other programs we can obtain funding for.*

*But, I would rather doubt that peer instruction would become a part of the office occupations course without outside funding - once more the major problem is with available money, and not the concept of the module."*

William Deutsh, CETA Program Director

*"Each peer instruction project that took place during these past eighteen months could be viewed as a success or failure, depending upon one's goals in each case. Ideally, peer instruction should be introduced by the teacher, but the teacher cannot use a tool he/she does not know, so there must be an alternative starting point. Each project was an outside idea. From this viewpoint, the CETA work stations were quite successful. All of the conditions and materials were ideal.*

*With additional funds the CETA Program grew too rapidly for peer instruction to continue without assigning a full-time person to both supervise the work stations and write the modules. This assignment would converge authority and responsibility--thus solving the only major problem the project could not resolve. Therefore, the future of peer instruction with the CETA Program will depend upon the budgeting of a full-time supervisory teacher for the work stations. That decision has not yet been made."*

Sara Duzen, Curriculum Developer

Future of Peer Instruction in Compton

*"The future of peer instruction in elementary subjects is tenuous. Too many of the necessary conditions are lacking--sufficient numbers of students wanting to learn the same thing, funded time to convert curriculae into peer instruction format, self-confident instructor, etc. In spite of this fact, the series of ruler modules was successful. One ABE teacher was grateful for the experience, and stated that she would definitely use peer instruction in the future and write her own modules. Peer instruction will continue in her class in the coming months.*

*Future planning for peer instruction in Compton will have to take into account considerably more staff time than is now customarily allowed for planning. As mentioned, it is more efficient to pay the expert to write the materials. My role, as curriculum resource teacher, would be to train and consult with teachers who ask for help, or who are assigned to carry out a peer instruction program.*

*...Peer instruction should be used to aid an existing structure rather than to provide structure.*

*"To try peer instruction as a mandated innovation, teachers should be requested to make short-term, clearly defined commitments. Teachers who respond well do not need extensive training and encouragement; those who do not respond well should be allowed to discontinue their commitment, since further efforts of encouragement are rarely fruitful."*

Sara Duzen, Curriculum Developer

*"As we move into the future, it is my hope that as we hire new members of our staff, we will be able to introduce them to peer instruction and, if they desire, to involve themselves and ther students with peer instruction, we can train them to write modules and to incorporate peer instruction into their program. Many of the things we have learned applied to adult education, generally, in California and possibly all over the world."*

Harlan L. Polsky, Principal

2. San Diego, California:

The San Diego effort was divided into three successive phases: (a) "Survival Skills", (b) Peer Instruction Reading Program, and (c) Outreach and Dissemination.

a. Survival Skills and Training of San Diego Personnel
Late September - February 1975

Memorial Adult School ABE head teacher, Autumn Keltner was chosen as peer project coordinator and HumRRO representative Laurie Mandel trained her in converting curriculum into the HumRRO format. In mid-October a peer instruction workshop for Memorial Adult school staff was held with the sample modules being operation of the "Aud-X" and Videotape Replay System; these skills were transmitted so successfully through peer instruction that staff decided to continue the teaching/learning chain on operating this new equipment with actual school students.

To launch the "survival skills" phase, interviews were conducted with various community agency representatives - HRD, Welfare, Public Health and a "survival skills menu" was presented to the two ability groupings of daytime ABE students at Memorial, orally to the group below fourth grade reading, in questionnaire form to the other group. The "menu" consisted of twenty functional literacy skills such as filling out forms, computing tax, etc. In both groupings, highest interest was revealed in figuring income tax and learning how to fill out a tax return. In all instances where we surveyed ABE students, however, the predominant orientation was toward reading. We never observed a spontaneous interest in the learning of survival skills per se. Work, therefore, began on developing peer instruction banking modules and one for completing the tax return. Tax experts were interviewed in San Diego and at the HumRRO home office to determine performance criteria and gather support materials in order that the tax module would be classroom operational by early February.

The tax module was eventually abandoned because it did not lend itself to a standardized, single correct-completion outcome. Each student would only have to fill his forms out one way, but in order to guarantee he could teach it to a student who might be filling it out differently, he would have to absorb an unwieldly amount of extraneous information. However, a "survival skills" packet in basic banking was designed, with a single consumer module added. By mid-February, a peer instruction system using the following skills was operational and fifteen students participated successfully: (1) Completing simple forms, (2) filling out money orders, (3) writing checks, (4) filling out deposit slips, (5) keeping a check record, (6) reconciling a monthly bank statement, and (7) figuring best buys in cans and packages.

According to ABE head teacher Autumn Keltner's assessment of this phase:

> *"Approximately thirty students were exposed to the modules (including Aud-X and Videotape-Relay System). With advanced students, check test (pre-test) was given and only those students who did not pass were part of the teaching/learning chain. Those students who passed the check test*

*were asked to become the person to prime the chain. From the very lowest (reading level-grade one) students in the Basic Education program were able to participate and feel successful with the forms module. Most also could handle the money order module. Fewer participated in the succeeding modules. Students who will never have the opportunity to have a checking account felt an extremely great sense of satisfaction in learning to write checks. Others said husbands or wives usually did this and they felt that they could now participate...At a workshop in April, 1975, attended by twenty-eight ESL teachers, an overview of the modules and techniques was presented. There was a great deal of interest and many requests were received for additional training and copies of material."*

Comments

A number of problems connected with the survival skill curriculum were encountered. First, there was little if any follow-up activity for students to continue to practice the survival skills they had learned; the concept was introduced with little reinforcement by continued class practice or even discussion. Second, the lack of a regular work period in which students might pursue their survival skills kept the idea from gaining student momentum; the San Diego administration never incorporated it into the ABE curriculum. Finally, and perhaps most significantly, the survival skills materials themselves seemed to lack interest for the upper level students (fourth - eighth grade readers); most lower level students (non - third grade readers) found them all intriguing, yet they could hardly read the minimal written instructions and criteria checklist for each module. Although strenuous attempts were made to strip these modules of all but essential wording, there remained the problem of reassuring students that the purpose of the program was to teach them the particular skill, not to read the module. The fact that for most of these lower level students, learning to read rather than survival skill training was their main objective did not help matters.

b. Peer Instruction Reading Program - Part I

March - December 1975

Since the survival skills experience questioned the ABE approach to illiteracy, the San Diego site team further investigated the state of teaching adults to read in public education. Through literature searches the team discovered that, to date, adult education programs have plainly failed to reduce adult illiteracy. The problem is particularly acute for adults with less than eighth grade education; it is extremely hard to help these individuals reach eighth grade equivalency.

Reading appears to be one subject where discouraging educational experiences in the past remain particularly crippling to student motivation. The majority of problem adult learners have had upwards of nine years of formal schooling, but read functionally below third grade level. Most traditional adult education programs perpetuate this discrepency by adopting the identical teaching methodologies and strategies which had helped to discourage and turn off the adult learners in elementary school. Again they are exposed to the teacher-directed classes or small-group reading experiences which had, in the past, made them retreat from the receptive attitude so critical to learning. Fearing to feel once again the sense of failure and inadequacy, they switch off and drop out.

The San Diego site team agreed that what was needed was an instructional approach to reading that insured a high probability of success for its students. Clearly it would have to be individualized, but just as clearly, self-instructional material would be unacceptable because it requires a minimum reading ability level that many of the ABE students do not possess. The HumRRO peer approach seemed ideal in that it was premised upon one-to-one "oral" instruction in small, accumulating units or exercises. It could provide each student with his own peer-instructor, away from the focus of an entire class; this instructor would give his student individually-tailored practice and feedback during the act of learning - the optimal learning environment.

However, a crucial problem remained: How to convert basic reading material into a peer instruction format? HumRRO research associate, Laurie

Mandel, contacted Dr. Grant Von Harrison from the Division of Instructional Research, Development and Education at Brigham Young University in Provo, Utah, to find out if his "structured tutoring model" method of teaching reading to beginners, based on a modularized phonics approach might be adapted for peer instruction units. On 4 April 1975, HumRRO representatives met with Dr. Von Harrison to plan an ABE reading program that would combine his phonics materials with the HumRRO peer instruction technique.

Dr. Von Harrison's materials are organized in sequential modules to teach basic word attack skills (blending individual sounds to form words) and to teach students to read 200 basic sight words (irregular pronunciations). When Ms. Mandel and Dr. Bialek approved the materials, HumRRO received permission from Dr. Von Harrison to employ them in conjunction with the peer instruction delivery system on a trial basis in the San Diego site. The combination promised a truly individualized reading program, with each student enjoying the undivided attention of his own reading teacher, with tests oral rather than written worksheets, with progress clearly charted through pass/fail performance tests, with non-threatening, small, sequenced phonics-based reading units.

These reading units are actually a series of "modules" designed to teach basic word attack skills: Level I of the program (non - third grade reading level), teaches the student letter sounds, blending and sight words; Level II (third - sixth grade level) teaches basic phonetic rules; irregular sounds of letter clusters and basic comprehension skills. Each "module" is broken down into exercises designed to teach a specific word attack skill: Module #1, for example, teaches the student to read five basic sight words; Module #2 teaches the student to produce five consonant sounds.

The HumRRO peer instruction technique provided the required one-on-one instruction for the BYU reading units: students teach each other. One student teaches another a particular reading technique--i.e. how to read five basic sight words; then that second student turns around and teaches the five words he has just learned to a third student; then that third student teaches them to a fourth, and so on.

As with all applications of the model, students must pass a performance test before he can teach. In this instance, if he can read the five basic sight words correctly he passes the test. Every student must pass this check-out test 100% before he is qualified to teach someone else and learn subsequent modules in the series.

The check-out test served as a pretest as well as a post test. If, for example, a student thought he already knew how to read the specific set of sight words, he simply took the check-out test for that unit. If he passed, he became a peer instructor for that module. If he failed, he worked with his peer instructor again until he passed.

In mid-April, fifteen students were given the "Beginning Reading I" diagnostic tests from the Von Harrison materials as well as the Woodcock Reading Mastery test. All students scored below third-grade level in word attack skills, qualifying them for Stage I (non - third grade reading skills) of the program. In mid-April, Stage I of the peer instruction program, consisting of fifty-four sequential instructional modules, was begun. By early June, twelve students were still participating in the program and most participants had completed half of the fifty-four modules. The three "dropouts" were the result of events not related to the attractiveness of the program.

Seven weeks after the program was begun, the semester ended. The staff was able to track down eleven students to retest on the Woodcock. Following is a summarization of that seven week trial:

1. Formal schooling ranged from zero to eleven years with a mean of 4.8 years.
2. Attendance at adult school ranged from ten years to two months. The student who had attended adult school for ten years had a Woodcock passage comprehension grade equivalent score of 2.7 years.
3. Students were in the peer instruction reading program for an average of forty-one hours with a range of from eleven to sixty-one hours.
4. The average number of modules mastered during the seven weeks was thirty-three with a range of from nine to forty-eight. There is a very high positive relationship ($r = .72$) between time in the program and number of modules mastered.

5. The beginning modules deal mainly with word attack skills. One student, in the seven week period, went from a 5.1 to a 12.9 grade equivalent. For the remaining ten students, the average gain was +.7 years.

Preliminary finds based on comparison of pre and post test scores on the Woodcock Reading Mastery Test indicated that regular participation in the program significantly improved students' word attack skills.

Students and teachers expressed overwhelming enthusiasm for the method and content of the peer instruction reading program. Classroom teachers were impressed by the high level of student motivation fostered by the peer instruction involvement.

According to site coordinator, Autumn Keltner's subjective assessment of the reading program and student response to it:

> *"Initially, two instructors, Shaw and Keltner and one instructional aide, Armour, managed the program. As changes in staffing occurred, Deidre Dyitt and Jean All, instructors in the Basic Education class, assumed responsibility for the program.*
>
> *There was initial reluctance on the part of students to assume the teaching role, particularly because they felt that they were losing in the area of learning. However, they quickly realized the value of teaching as a reinforcement of learning and would ask to teach immediately a module that had been especially difficult for them to learn. They became much more critical of themselves and would not want to teach anyone until they were absolutely sure they had mastered the material themselves. They felt the need for mastery so strongly that they would copy and ask to take the material home for practice and would work straight through breaks.*
>
> *The thrill of being able to <u>teach</u> someone else for the first time cannot be measured except in the eyes and voice of the student who has always felt himself a*

*failure, at the bottom of his class. Every student who participated in the program was able to experience the thrill of being teacher in several steps of the reading program.*

*Because of numerous interruptions in the continuity of the program, pre and post tests cannot possibly adequately measure student progress. Unmeasurable gains were especially evident in students' ability to attack previously unknown words in daily classroom reading activities. Students entered into reading activities with a feeling of confidence and expectancy of success heretofore not experienced. Parents and children worked together in some cases in the decoding processes."*

In mid-October, 1975, the peer instruction reading program was introduced in Hallie Harrison's Basic Education class, Hoover campus, East San Diego Adult Center. By December, 1975, twelve students were participating in the program with several reaching Module 40. The class was increasing in attendance. Mrs. Harrison commented to site coordinator Keltner that she didn't know what she would have done without this program to handle the constant influx of new students into her class.

Site Evaluation

The San Diego site was plagued with administrative problems which seriously impaired the successful continuity of the reading program. In her final observations on the HumRRO project, site coordinator Autumn Keltner first discusses its operation in the classroom and then comments on the backup support needed for such an innovative program to get off the ground:

1. *Classroom.*

   *If all students are not involved in peer instruction, they must be planned for.*

*Students often have to wait either for the check test (quality control person) or for a teacher or student. To alleviate this problem, material must be provided that will give the students worthwhile activities while waiting. In the reading program we filed supplemental worksheets for each step for this purpose.*

*Quality control must not be allowed to break down.*

*Teachers must be willing to try new ideas and techniques, experiment. The use of peer instruction should be the teacher's choice not imposed.*

*Peer instruction works! If a teacher is willing to make the effort, it is definitely worth it. The reading gains are evident. The growth in feelings of self-esteem are thrilling to those in the classroom. People do learn best when they can practice immediately what they have just learned. You, the teacher, can ascertain with peer instruction what they have learned much better than in traditional classroom instruction. Often the class must proceed whether everyone has accomplished the task or not. The slower or absent student gets farther and farther behind. This is not true in peer instruction. I'm committed to the concept.*

*Material in this reading program is not really adult. An adult adaptation would have been better. However, it was not a problem with Memorial students.*

2. *It was impossible to foresee or do anything about the problems that occurred due to changes in the administrative positions at Memorial Adult Center. These are not likely to occur in this magnitude anywhere again. In this case, two administrators totally committed to an experimental*

*project contacted teachers who also became committed and a district contract was drawn up. Two totally uncommitted administrators were then hired and were the cause of the bulk of the problems which followed. They not only were not committed, but they did not want to be tied to any programs begun by their predecessors. If there had not been a district contract, the program would have gone completely down the drain.*

*At the moment, the materials are at Memorial, but not in use. The teachers are interested in using them but have a directive to come up with a new plan.*

*Once seeded, the program should be able to run itself. Occasional visits by HumRRO personnel are needed in order to monitor and critique the overall operation. Someone from the outside can get an overall picture that it is impossible for the staff to see.*

*I don't think the experiences in San Diego should discourage future participation in Adult Education programs.*

*Peer instruction should not be the only method of instruction in any basic reading program. It fits in beautifully as an alternative or supplemental program, complementing class, small group, and individualized learning instruction.*

C. CONCLUSIONS/RECOMMENDATIONS

After our two-year application of the HumRRO Peer-Instruction Model to adult education programs, it seems responsible to make some conclusions:

As regards the model itself:

1. Not all educational environments are conducive to peer teaching. While the model is ideally suited to a training/education arrangement which

features a steady in-flow of students, it works less well within a fixed, closed student input situation. Yet, even within a fixed-student, classroom setting, it can warrant the preliminary investment of preparing modules, testing them, and arranging for smooth classroom management of the system if:

a. there is a sufficient number of students who stand to benefit - we generally estimate fifteen or more - and

b. there are more than three or four modules in the skill series. (Dropping single module exercises into a small class is inefficient despite the motivation-enhancing aspects of the peer teaching concept.)

2. Not all instructional content lends itself to peer teaching. Whereas most psycho-motor skills have proven themselves to adapt well to peer teaching - where the criteria test is a manual operation which need only be performed correctly to be tested, curriculae in the area of abstract concepts and cognitive learning is often harder to break down into performance criteria while still making absolutely sure the student has learned the concept when he takes the test. And, it is far harder to insure that the more abstract concepts that lie behind the exercises being practiced are being adequately taught and comprehended while the peer teaching is under way.

Therefore, while any content is theoretically capable of being broken down into performance-criterioned steps, it is not economical or effective to try out the model with content that contains:

conceptual knowledge as its primary performance

procedural tasks having many required variations.

(The five conditions for "when to use peer instruction" found on pages seven - eleven attempt to synthesize the contraints upon subject content and instructional context placed by the peer-instruction model.)

As regards dissemination and on-site implementation of the model in adult education:

1. Extensive training and follow-up monitoring of staff is essential if the model is to survive beyond its developmental stage. This training

should have two major thrusts, (a) producing viable modules whose criteria adequately cover the skill's critical performance standards, (b) managing the system so that it functions effectively whether or not it is operated within a classroom context. Both skills require specialized training and aptitude; they are not normally part of the regular ABE teacher's repetoire. Hence the agency seeking to adopt or even experimentally introduce peer instruction must appreciate the departure from routine class-preparation and strategies which the model represents, and make the necessary commitment to see through the training required and problems that arise. If such commitment does not develop, it is highly unlikely the model will be more than a single-semester, "show-case" project.

2. It seems that hard and fast performance criteria are especially difficult to derive and uphold in the field of adult education. Most ABE teachers have been permitted to evolve a highly personal approach to their classes; they resist change, particularly when it insists upon a strict derivation of the performance standards for a learning unit and demands that students meet those criteria 100%. These teachers do not seem to relax when they are urged to elicit these criteria themselves in order to be confident that they are within reach of their entire student range.

3. Unless an instructor is quite self-confident, they are also threatened by the shift in their role from classroom ringleader to classroom manager which is imposed by the peer instruction system. Teacher reaction to the model has proven critical to successful implementation because, unlike military, penal institution, and industrial training environments, the "chain of command" in educational institutions is tenuous. A program administrator can approve of a special environmental project, but unless he can "sell" it to his teachers, it has little hope for adequate testing-out.

# CHAPTER IV

## DISSEMINATION

Throughout the Adult Peer project, a search for the optimum dissemination strategy was conducted. In fact, one of the major questions which impelled this study concerned the feasibility of introducing new instructional systems and strategies into the "real world" context of ongoing adult education programs.

The search involved (a) development of a largely self-instructional manual which would enable an interested administrator or teacher to implement the model*, and (b) workshops designed to allow participants to directly experience the model.

In a major effort, HumRRO sponsored a workshop held in Aspen, Colorado in July 1975. The end of workshop evaluation report appears in Appendix D. It is clear from this evaluation that interest in the models was high. But interest alone is not sufficient. Clearly, a paradox exists in attempting dissemination through such workshops. If the developer wishes to have a wide dissemination, he is wise to invite administrators and state and regional officials to participate. But these individuals have little direct contact with students and so the developer has to hope that these officials will be interested enough and trained adequately enough to turn around and train teachers, a highly unlikely prospect. On the other hand, if the developer wishes to have more students exposed to his model, he will invite teachers to his workshops for training. But then the dissemination usually stops at the classroom door and the overall impact of the model is bound to be minimal.

Of the thirty-four participants at HumRRO's workshop, nineteen responded to a follow-up questionnaire and twelve of the nineteen indicated that they planned to or had already held a dissemination workshop. From our experiences in directly trying to implement the models ourselves, we are frankly dubious that a half-day or whole day workshop could result in any long lasting or meaningful implementation.

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* The Manuals appear as separate appendices to the final report.

A second generation dissemination occurred at both the Compton and San Diego sites, however. Staff members who had been trained by HumRRO and who identified with peer instruction voluntarily, organized workshops for other teachers in the system in order to encourage others to apply the model.

In an attempt to inform others in the adult education field about the model, the staff made two-hour presentations at the annual conventions of the Adult Education Association in October, 1975, in Salt Lake City, and the National Association for Public, Continuing Adult Education, November, 1975. At the conclusion of each of these presentations, a handout was distributed describing the imminent availability of the manual upon a written request. No requests were received indicating the failure of the attempt at dissemination. There were, however, numerous requests that HumRRO send a team to a location in order to conduct local training workshops, but since no funds for such activities were included in the project, this could not be accomplished.

The dissemination experience demonstrates that the model is seen as inherently applicable to adult education but that there are few local resources available to support implementation.

## SECTION II

## AN INSTRUCTIONAL SYSTEM FOR CONSUMER DECISION MAKING

### I. BACKGROUND

The initial focus of this project was the process of staff development. The preliminary objective was to help staff development leaders learn a new and more effective means of stimulating and supporting the professional growth of ABE teachers. The project took the form of an Institute for training staff development leaders in the use of a new approach in their work. Problem solving was the overriding theme. It was theorized that through problem solving teachers could identify their own professional development objectives and reach them through heuristic methods. It was reasoned that this would make staff development more individualized, more responsive to existing needs and problems, more highly motivating to the teachers involved, and on the whole, more effective than the traditional methods of inservice.

For reasons that are presented below, this project went through a major transition through which the emphasis was shifted from staff development to curriculum development. Problem solving by the ABE student was the learning mode and the content became an explicit element in the project, it was the general area of consumer education, and more specifically the process of consumer decision making.

This transition did not rule out staff development through problem solving. Rather, it opened the door to problem solving wide enough to include the student and thereby increased the range of teacher options in the design of instructional systems. The teacher was given a new range of tools to extend his repertoire of professional competencies. Furthermore, this was accomplished in an area of ABE where little has been done to improve curriculum design.

#### The Staff Development Institute

Twelve participants were selected from applications received from staff development leaders nominated in Regions IX and X. This group convened for two five-day work sessions in December and May respectively.

During the first work session (December 9-14) the overall goal of each participant was to develop his own staff development plan to be based on the problem solving model. To help the participants reach their goals the Institute staff offered a heuristic learning model and a series of problem-solving situations for trying out the model and inventing teaching strategies. Such techniques as role playing and micro teaching were also used for this purpose. Other techniques such as peer instruction, and group problem solving were demonstrated by HumRRO staff and practiced by the participants.

Individual participants received help and guidance from the HumRRO staff as desired. Selected readings and technical reports on new methods and ideas in staff development were available.

## Site Visits

During a five-month period following the first work session, HumRRO staff members visited each of the participants once to provide additional help and feedback and to evaluate some of the effects of the Institute.

The Second Work Session (May 19-24) was designed in accordance with the needs of the participants. It was expected that participants would want to share experiences, problems and successful solutions, and help each other plan further improvement of staff development programs. Role playing, problem solving and theory building were continued as needed.

## Results

### First Work Session

There was a strong positive response by the participants to the first work session. An attitude survey conducted throughout the five-day period revealed that the participants were intensely interested and involved in the activities. However, in large measure their grasp of the problem solving model and especially their confidence in their ability to apply it was weak. They had been guided through this heavily structured workshop and at the end felt dependent on the Institute staff. The individual plans for carrying the problem solving model over to the local

staff development activities were in most cases not well worked out. There were several requests for HumRRO staff members to use the site visits to introduce the problem solving model to the local teachers.

Site Visits

The purpose of the site visits was to observe the progress of the respective participants toward the establishment of a problem-solving staff development program. In those instances where a start had been made in this direction the participants had applied the model as a new approach to ABE and ESL teaching, that is, they were using problem solving as a teaching method to be conveyed to ABE teachers but not as a staff development method. The patterns varied considerably from one site to another. In several cases nothing had been done to follow through on the commitment to introduce problem solving into staff development activities. At the opposite extreme, there was a professor of adult education who had conducted several workshops for teachers modeled after the first work session of the Institute. A vice principal of an adult school had conducted an inservice program for her own staff based on problem solving. The directors of three adult education programs from neighboring districts joined forces to provide inservice training for their respective teaching staffs. In all instances, problem solving was attractive to the participating teachers because it appeared to be a promising teaching approach, highly motivating and adaptable to the individual student in both the classroom and learning center setting. Teachers who came to workshops were looking for help in understanding the general strategy of the problem solving method and specific assistance in adapting the method to specific courses and student categories.

Second Work Session

On the basis of the site visits the second work session placed new emphasis on the managerial aspects of staff development. The Institute participants had been encountering difficulty in bringing about any systematic change in their teachers despite the successes achieved in initial workshops or inservice courses. After a day of reporting their activities

since the first work session and discussing these reports, the participants were introduced to (1) participative problem solving, (2) management by objectives and (3) peer instruction. Once again the reaction to the new techniques introduced in the Institute was enthusiastic and virtually all the participants felt that these techniques would be very useful in their work. Nevertheless, it was recognized by all that the exposure time was extremely short and that without regular support from the Institute the necessary changes would not occur or continue.

In the final discussions and analysis of the Institute the predominant view was that the dissemination of the problem solving method of teaching would have exportability and durability only through the development and distribution of materials designed for this purpose and accompanied by explicit theoretical and "how to do it" materials, and that only through the use of these materials could a teacher begin to develop a general awareness of what was involved in the design of a heuristic learning program. It was finally decided that rather than conducting a series of workshops on theory and methods for the Regional Staff Development Projects as originally planned, the project would focus its attention on the design and development of ABE materials that would embody the problem solving approach and provide a concrete means by which teachers could make a successful start in this mode of teaching.

## II. PURPOSE

Decision-making is a basic survival skill. It could be argued that it is more fundamental and essential in daily life than the skills of reading or computation. People who are unable to make prudent decisions for themselves can only take action impulsively or depend on the decisions made by others. Neither of these alternatives is likely to serve the best interest of the individual.

Most ABE programs typically concentrate on the teaching of basic skills and, more recently, "survival" or "coping" skills (functional literacy). Teachers and administrators of ABE programs note, however, that even when ABE students are equipped with some basic literacy skills and with adequate specific knowledge or information, many are still unable

to make prudent or self-enhancing decisions when confronting institutions, agencies and individuals in their day-to-day encounters with the world.

In Adult Basic Education, as in most other areas of education, decision-making has been virtually ignored as a basic skill. People are taught how to balance a checking account, but not how to decide which of two cars to buy.

If a way could be found to teach ABE students to acquire basic decision-making skills applicable to a wide range of encounters, it would be, according to ABE educators, a valuable addition to the skills presently taught in the program.

Decision-making skill is not inborn. It must be learned by experience. But people do not always have sufficient real-life experiences to learn by and too often the mistakes that are made when playing for keeps cost more than the lesson is worth. A safe and effective alternative means of learning to make decisions is through a process of training in which the learner becomes acquainted with decision-making in simulated life situations where it is possible to learn by experimenting and problem-solving without risking the unhappy consequences of a bad decision.

The prime objective of the instructional method developed in this program was to build the competencies of ABE students in preparing for consumer decisions.

The basic consumer decision can be reduced to the question: "To buy or not to buy?". If the answer is reached impulsively without information, without analysis, without weighing the present facts of the situation and the future probabilities, the decision is likely to be a bad one in that it will produce unwanted results. The decision-maker will be more likely to buy when he should not or not buy when he should. Both kinds of errors can be reduced through a rational process of information gathering, analysis, and a general reduction of the complex elements in the choice to the simplest possible terms.

The term "hands on" learning is enjoying increasing popularity recently in the wake of growing interest in on-the-job training. The underlying principle can be traced much further back than John Dewey. We are now just rediscovering what pre-technological tribes have known almost

forever, that we learn by doing and are most receptive to instruction when it is relevant to what we are doing. When the activity is physical, hands-on learning is easy to arrange. When it is cognitive one has to invent ways to permit the manipulation of ideas. This is particularly true when the activity is heuristic, when the learner is searching for a solution to a problem.

An important objective of this project was to create a "hands-on" learning system that would permit students with relatively poor cognitive and verbal abilities to find their own solutions to cognitive problems; to engage in operational thinking, exploring cause and effect relationships by performing operations through the movement and grouping of data cards and the processing of the information contained on the cards. It was especially important to put the learner in the "driver's seat" so that he could chart his own course toward a problem solution that would reflect his prior knowledge and the kinds of new data that would appear most useful to him. In addition, a problem-solving approach to learning keeps the learner in a "no-fail" category. Each move in a heuristic learning pattern is nothing more than a test, similar to trying out a piece in a jigsaw puzzle. Nobody ever regards a mismatch as a failure. It is merely a data gathering operation. The same is true in preparing to make decisions. One becomes more and more proficient in this activity and the resulting decisions may become more and more satisfactory in the eyes of the decider. But nobody tells him if he is right or wrong. He must decide for himself how content he is at the moment with his own performance. ABE students with their long histories of school failures have more to gain from "no fail" learning than anybody.

## III. DESIGN AND DEVELOPMENT

What emerged as the main and final phase of this project was a new instructional system for developing skill in consumer decision making. It met the following criteria: the learning objective was a "survival skill"; the instructional system was based on the problem solving model; and the design of the system could be adopted by teachers to generate their own curriculum materials.

Development of a Prototype Curriculum

The first step was to identify an easily accessible student group that would help select a high priority survival skill as the main learning objective, and would then serve as a field population for trying out the system and materials at various stages of development. The group first selected was the "Now You Can" Adult Education Program in Salinas, California, an affiliate of the Neighborhood Youth Corps Project, which is a locally operated program subsidizing over forty students, most of whom were working toward the G.E.D. The student population was mostly Mexican-American and a substantial number of them were pursuing an E.S.L. program along with the G.E.D..

With the help of the NYC Director, the HumRRO staff developed a "survival skill" needs assessment survey. Ten specific consumer survival skills were generated by student respondents for inclusion in the curriculum. The skill most requested, "Buying a Used Car", was selected as the content area for initial development. Other expressed needs included "renting an apartment", "preparing a budget", and "finding a job."

Initially, the HumRRO staff designed a comprehensive curriculum on used car buying. The curriculum, which offered both teacher and student manuals, included problem solving situations involving interest computations, tests for car reliability, cost data, consumer resource data on car types, a buying guide (helpful strategies), and critical vocabulary.

The design of the curriculum was based on the assumption that a person will be more likely to make rational consumer decisions if he has the following competencies:

1. General skills for obtaining, organizing and interpreting information.
2. General knowledge of the main categories of information that apply to the analysis of any purchase situation.
3. Specific knowledge of the categories of information that apply to the analysis of particular purchase situations (e.g., buying a car).
4. Skill in performing a purchase analysis and in interpreting the results.

It was further assumed that people can acquire these competencies through experience and practice gained by solving simulated decision making problems. The instructional system for decision making as developed in this project was organized as a series of problems to be solved either by the individual or by pairs or small groups of students.

The initial "car buying" curriculum was heavily weighted in the process of analyzing the condition of a used car. With the assistance of skilled auto repairmen a chart was developed displaying a series of tests that could be applied to a car, signs of trouble, and approximate cost of repairs. With such a chart a person could presumably determine for himself many defects in a car and the approximate cost of repairs. Since it was not practical to send the student out to used car lots to try out their diagnostic skills, real car conditions were simulated with 3x5 cards that could be drawn from an information box by category. The student could gather the data he needed by "inquiring" of the information box which was accomplished by pulling out cards that had various categories of information. In this manner the student could determine the selling price, the monthly loan payments, the size loan he could get, his own available funds and expected future income. Other cards described characteristics of the car such as color, age, mileage, etc. By gathering data, card by card, the student was able to collect information needed to prepare him to make a purchase decision.

## Results of Initial Field Trials

The student and teacher reactions to this initial form of the curriculum were favorable although there were two main problems. The process of car analysis was unrealistic. Most of the mechanical tests of the car demanded a trained eye and ear, and certain information could not be obtained without special equipment or "opening up" the engine. The simple tests recommended in the chart were not always significant or conclusive. A kind of mechanical literacy was being taught more than consumer decision making skills.

The second problem was that the curriculum design was not readily exportable. Teachers felt that they would have difficulty adapting this model to the teaching of other survival skills. It was clear that the

emphasis had to be shifted from mechanics to economics. The problem solving model was working in the sense that it stimulated student interest, but a new model was called for in addition: a consumer decision model, one that was broad and basic enough to apply to almost any consumer decision and could serve as a guide to any teacher preparing materials for a consumer decision problem solving curriculum.

The Consumer Decision Model

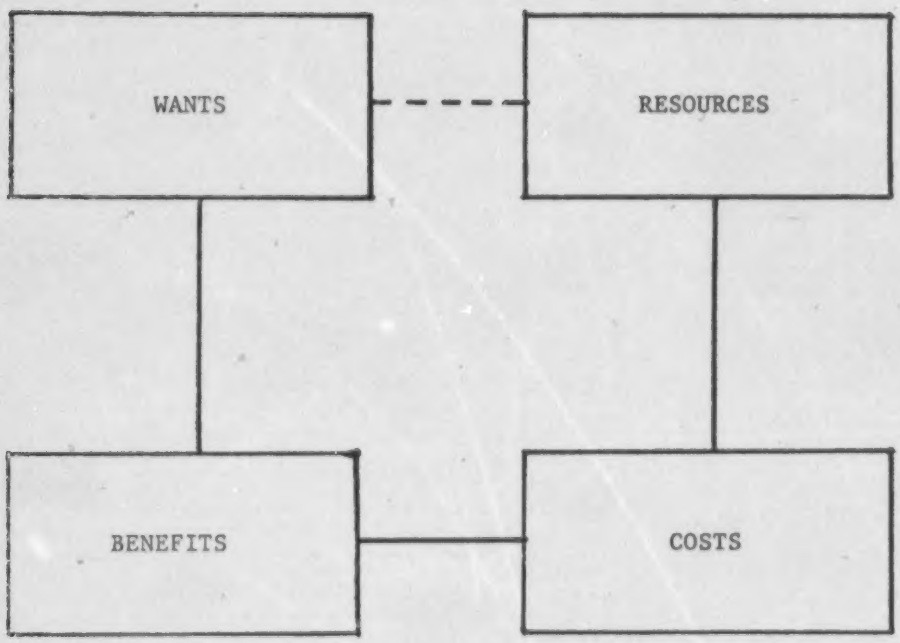
After a period of experimentation, the model in Figure 1 was adopted and used to guide the development of the consumer decision curriculum. The four elements WANTS, RESOURCES, COSTS, AND BENEFITS define the categories of information that must be considered in every consumer decision. These categories are combined in adjacent pairs to form four axes. Each axis represents a key question. The decision to buy requires a "yes" answer to the first three questions.

1. The wants/benefits axis poses the question: "Does this prospective purchase meet my needs or satisfy my desires?"
2. The cost/benefits axis poses the question: "Is the benefit of the purchase worth the cost?"
3. The cost/resources axis poses the question: "Can I afford to make this purchase?"
4. The fourth axis poses a more general question that does not need to be considered before each purchase, but should be thought about from time to time in the light of previous decisions and their consequences. The question is: "Can I afford to satisfy my present wants?"

This model provided a valuable new tool for consumer decision making curriculum development, as well as a framework for data gathering, information processing and decision making. It provided a structure for building decision making problems in a wide content area. All that was needed was to invent a set of situations in which the decision whether or not to make a particular purchase would have to be made. Specific data were generated to fit each of the information categories except WANTS. This was excluded in order to force students to rely upon their own values

FIGURE 1

THE CONSUMER DECISION MODEL



rather than assuming fictitious ones. Each of the three data categories was further subdivided. For example, under the heading of "resources" would be "cash on hand", "anticipated monthly income", "available credit", etc. Under "costs" the following might be included: "selling price", "monthly payments", "loan interest", "necessary immediate repairs", "monthly upkeep", etc. "Benefits" could include a variety of specific attributes (positive and negative) of the item being considered for purchase. If it was a car, the make, year, mileage, condition, color, etc. would be weighed by the prospective buyer in preparation for his decision.

Application of Problem Solving to the Consumer Decision Model

The instructional strategy was to give the student an array of data items and then allow him to work with these in his own way to reach two clearly defined goals; (1) to decide whether or not to purchase the item in question, and (2) to make clear, rational justification for the decision.

To facilitate this strategy all the relevant data were put on 3x5 cards. Each problem could be presented to the student as an unsorted deck of cards. On one side of each card was the category of information it contained (selling price), and the other side was the specific data for that category in that problem ($5,000).

A deck might include as many as fifteen cards or more. It was not possible by simply scanning all of the cards for anybody to arrive at a rational decision. The student had to have a strategy for reducing the data to a level of simplicity that would enable him to answer the three questions: Does it satisfy my needs? Is it worth the price? Can I afford it? The goal was clear but the means for getting there were not. By determining for themselves how to handle the data in order to reach their goal, students could be drawn into problem solving. As active problem solvers they would become especially receptive to teacher guidance and suggestions that would help them reach their goal and develop their decision making skills.

New Site for Field Trials

Expressed interest by Mr. Jerome King, former HumRRO taff Development Institute participant and negotiations with Mr. Edward Lindsey,

Director of Adult Education, Pima County, Arizona, resulted in the selection of the South Tucson Learning Center as the site for the extended classroom trials of the consumer decision making curriculum. The South Tucson Learning Center, a locally generated and operated program, satisfied the original criteria for site selection. Classes for GED, ABE, ABE/ESL and advanced ESL are offered. The student population is primarily Mexican-American, but also includes Thai, Vietnamese and American-Indian students.

HumRRO staff met with interested teachers to brief them on the new curriculum and instructional system and outline respective levels of responsibility for the extended classroom trials.

Most of the teachers involved in the field trials had attended two workshops on problem solving conducted by HumRRO staff during the Staff Development Institute phase of the project.

Students and teachers were immediately receptive to the new design. It put the learner "in the driver's seat" and provided him with a set of data to work with. He had the option of using a heuristic process to find his own solution or to obtain help from the teacher. It was clearly a "no lose" situation. The teachers immediately recognized the new model as a vehicle for individualized learning that could be used in a tutorial or group situation. Students could work in pairs in a classroom setting or learning center assisting each other or requesting help when they could not solve the problem themselves. It was also evident to the teachers that the use of cards facilitated the process of sorting, grouping, and combining data and thereby reducing information to a form that provided a meaningful basis for decision making. The potential application of this design to a wide range of decision making problems was recognized.

Once the materials and procedures for introducing students to consumer decision making problems were created the next step was to design a series of sequential problems to lead students away from their initial dependence on the cards. The ultimate objective was to enable the students to use internalized cognitive structures for gathering data in more realistic simulations. Ideally, the consumer develops an internalized set of information categories for any purchase analysis. He collects information actively to fit these categories. He must learn how to

organize and reduce the information to a point where they will support a rational decision.

The new problems were organized into four levels of increasing difficulty which had to be mastered in sequence. Level I problems were concerned with the cost/resource axis only, and only cards presenting data from these two categories were included in the problem decks. The problem involved card sorting, and simple arithmetic. Where credit buying was involved, it was necessary to treat periodic and one-time costs separately. Having enough for a down payment is not sufficient if your income does not permit keeping up with the monthly payments. The important feature of Level I problems was that all the required data were provided in the deck and no unnecessary information is included. This was a concrete means of learning what information is needed to make a purchase decision. Only one purchase item was considered in each problem and the object was simply to make the decision to buy or not to buy on the basis of whether resources equalled or exceeded costs.

Level II was similar to Level I with the important exception that a number of cards were not initially presented. In addition, a few benefit cards were included gratuitously, revealing some good or bad features of the item. The purpose at this level was to impress the learner with the necessity of certain kinds of information in answering the cost/resources question. Without knowledge of required monthly payments, for example, it is impossible to know if one's monthly income is sufficient to permit taking out a particular loan. As the student turns over one card after another he comes to see the essential nature of various kinds of information. He also recognizes that benefit data are of no value in making a cost/resource decision. Even the best buy is of no value if you can't afford it.

Level III introduced the relative nature of consumer decisions. In each problem there were two items to be considered for purchase and the decision had to be made between them. The decks included resource, cost and benefit data cards and all three axes were required in preparing to make the decision. After determining that he could afford both items, the student had to decide which was the better buy.

Level IV dispensed with the cards entirely. The simulation was achieved through role playing. One student was designated as the buyer and another as the seller. The former was provided with data pertaining to his own financial circumstances. The seller had background data on the item being considered by the buyer. The dialog between the two would consist of attempts of each to gain the information he needed from the other. The seller wants to know how much the buyer can afford to spend, what benefits are attractive to him. The buyer wants to know what defects the item has, whether other products have the same benefits for a lower price.

Once the teachers and students became familiar with the overall design of the curriculum, it became a simple matter for teachers to generate materials for other consumer decisions such as renting an apartment, planning a budget, buying a house. In all instances the basic categories of data were the same: resources, costs, benefits and wants. Of course, the data subdivisions would vary. There are a great many costs involved in buying a house and relatively few in renting an apartment.

## IV. EVALUATION

Inasmuch as this was a developmental project, the results are best seen in what was produced and how this product served the needs of the students, teachers, and administrators who worked with the instructional system at the field testing site.

The evaluation procedures were deliberately kept informal to avoid imposing unnecessary constraints on the teachers as they explored the possibilities of a new instructional design. The field trials were primarily intended to see if the system was workable with the appropriate student populations, whether it produced sufficiently high levels of motivation to sustain student activity through successful problem solving, and whether in the judgement of the teachers the students were learning a useful survival skill.

### Analysis of Field Trial Performance

Two problems were used in the trials: (1) Buying a Used Car and (2) Renting an Apartment. They were introduced into two categories of

of student classes: (1) ABE and (2) a combination of ABE/ESL. Three teachers were involved in all, two of whom had been trained in problem solving methods and theory in HumRRO staffed workshops.

Because of the mastery design of the instructional system, there was no basis for assessing levels of learning. The students progressed through four problem levels in sequence and could not advance to a new level until their performance at the preceding level satisfied performance criteria. Therefore, the measure of program success was the number of students who had progressed through all four levels of the problem within an established time span. Table 1 is an analysis of the data on this variable. It was clear from these data alone that the system was workable, and posed no serious language difficulties for the major ethnic population group of the area (Spanish Speaking). Table 2 provides an ethnic population percentage analysis of four population categories. Despite the fact that all the curriculum materials were written in English, and the percentage of Anglo students was low in both educational categories, only 3% of the ABE/ESL students failed to complete the "Car" problem and 100% completed the "Rental" problem, in both educational categories.

Observations Made by Teachers Conducting Field Trials

Explanation of incomplete participation

Erratic attendance typical in an adult classroom affected participation in group situations where the working of the problem was spread out over two or more days.

Lack of interest on the part of ABE students conflicted with GED objectives. Some students felt the problem was irrelevant to their GED goal.

There was a lack of interest on the part of some ABE students who felt they could already handle decision making in the areas (car, rental) tested.

Problems with instructional system regarding classroom management

Problems come up in a group situation where some class members may not wish to participate and the classroom is not set up or the teacher not experienced in handling a multi-activity situation.

Table 1

NUMBER OF STUDENTS STARTING AND COMPLETING EACH OF TWO PROBLEMS

| | No. of Students Starting Problem | No. of Students Completing Problem | Dropouts Total | Dropouts % |
|---|---|---|---|---|
| Car Purchase Problem | | | | |
| ABE (2 classes) | 20 | 15 | 5 | 20 |
| ABE/ESL (4 classes) | 90 | 87 | 3 | 3 |
| Total | 110 | 102 | 8 | 7 |
| Apartment Rental Problem | | | | |
| ABE (1 class) | 10 | 10 | 0 | 0 |
| ABE/ESL (1 class) | 25 | 25 | 0 | 0 |
| Total | 35 | 35 | 0 | 0 |

Table 2

ETHNIC ANALYSIS OF STUDENT POPULATION WORKING WITH DECISION-MAKING PROBLEMS

| | ABE/ESL | ABE |
|---|---|---|
| Spanish Speaking | 85% | 65% |
| Asian | 10% | - |
| Anglo | - | 29% |
| American-Indian | - | 6% |
| Other | 5% | - |

In the ABE/ESL classroom there were few problems as all of the students wanted to participate. In the ABE classroom we already had an individualized learning situation set up so it was possible for an instructor to work individually or with a small group on the problem while the other students continued their own individual tasks.

Another factor that interfered with the system was the nature of the group. We found that some students worked well together in groups, encouraging and assisting each other. Other students, however, when in groups tended to be negative in attitude, probably a defense against the feeling of possible failure. These particular students performed much better when working individually with an instructor and we decided to adjust their entire classroom program as a result of what we learned in using the model.

We had no problems in introducing the materials other than some vocabulary explanations that were needed by some students. This was handled by group discussion of the vocabulary.

The cards are a big advantage as the data can be seen in detail and manipulated easily. Also they are good in the variety they offer to the student used to workbook-text kinds of activity.

The students reactions to the Decision-Making Model were largely positive. They enjoyed the experience and felt they had learned something useful. Only a few students felt it was irrelevant because of their past experience and/or their personal goals regarding school.

Present and future applications of instructional system

The model will continue to be used in this program. Teachers from both ESL/ABE classes and ABE classes have used the car and rental problems with success and will continue to use it with new students. We also intend to incorporate the model as an instructional strategy in teaching modules we are designing and field testing. These modules are lesson plans designed to teach those areas of practical learning outlined in Northcutt's APL study. Many of the APL objectives cover areas such as consumer awareness that easily lend themselves to the use of the decision making model as one teaching strategy.

Student benefits

The students learned the importance of gathering as much information as possible when making a decision. They learned that some information is more important than other information. They learned to categorize and evaluate the information they had gathered and to explain their decisions based on the data they had.

Observatations of Administrators and Curriculum Developers

Given some instruction in the use of the model and pre-made materials, any teacher should be able to use the model in his class if the interests and goals of his students are in the area of practical learning (and not GED preparation only). The model will be most easily used by those teachers who can use the model with the entire group or by those who teach in classes already designed to deal with a variety of activities at the same time.

Site criteria for project success - One ESL/ABE or ABE teacher at each learning center using the model with at least five students each semester. Design and use of one additional model each semester.

The writing of the problems is the greatest problem in incorporating the model into our program. Writing the problems takes thought time and production time. Most ABE teachers are part time and receive little or no compensation for materials development. In our program curriculum development and production is handled by a committee of part time teachers that meets once a month for two hours. This group will work together to design and produce new problems and try them out in their classes.

Future decision making problem planning should allow for the paid time of some staff to develop and produce materials.

The limits of the decision making model in our program are due to the lack of personnel to write the problems. Other than this, the model is fairly easy to disseminate to other teachers and is useful as a teaching strategy in both ESL/ABE and ABE classes. Since the original group here was trained by HumRRO, three other teachers have learned the model in informal sessions and have used it with success in their classes. All teachers who have used the model would like to have new problems to try, but they are all part time teachers and unable to spend the time on designing them on their own.

We found that the only monitoring that needed to be done was easily handled by the learning center supervisor. Any local coordinator who can check periodically on the working of the problem and be available to answer questions and coordinate evaluation could provide all the monitoring necessary.

The decision making model will continue to be used in future ESL/ABE and ABE classes. At the moment we are limited to the car and rental problems, but the curriculum committee mentioned above is planning to work on designing new problems during their monthly meetings this semester. We hope that teachers working in pairs in a workshop setting can design problems to share with the entire group and that the production of the cards can be handled by clerical staff or volunteers.

STLC is also dependent on the materials made up by the curriculum committee but teachers at that center are continuing to use the two problems we have on hand and have shown interest in using more..

The model was presented to Tucson program teachers in a mini-workshop conducted by Liz Evans in mid-November 1975. Ten teachers attended the session and eight definitely were interested in using the model in their classes. These same teachers will make up the core of the curriculum committee and will be involved in the production of additional problems this spring semester.

Informal instruction in the use of the model was given to three additional teachers on an individual basis and these three teachers have used the problems we have and are interested in having more to use in their classes.

The problems have now been used by at least one teacher in each of the three learning centers in Tucson.

## V. DISCUSSION

This phase of the project has achieved two main purposes. It has produced and field tested a new instructional system including a teachers' manual and it has explored the possibilities for applying this system to Adult Basic Education. The most unique characteristic of the new instructional system is that it incorporates two models, a consumer decision model

and a problem solving model in such a way that the second model is the vehicle by which the first becomes known to the learner.

The underlying difficulty for the consumer education teacher is that in order to teach a person to become a rational consumer decision maker, one must introduce him to the concepts of WANTS, RESOURCES, COSTS AND BENEFITS and their interrelationships. These concepts and relationships constitute the consumer decision model, which is quite abstract and complex. ABE students can be expected to have great difficulty understanding and learning to use the model if it is presented in its most abstract form.

The alternative approach introduced in this project was to use the consumer decision model as a framework for generating sets of data to be presented to students as simulated decision problems. All items of data pertinent to making rational purchase decisions were put on individual cards, which could be readily scanned, sorted, combined and simplified to generate a rationale for a decision. The students had a goal (to make a decision) and a heuristic means of trying to reach it (card manipulation). The entire process was a form of problem solving which could be characterized as active, interactive, individualized, autonomous, inductive and goal oriented.

This new instructional system should be of interest to all teachers, but especially teachers who are trying to teach abstract subject matter to students who have difficulty with abstraction and the language needed to convey it. The manipulation of cards has several advantages. One is the element of autonomy it gives the student who is free to collect, and manipulate the data. He can experiment and literally play with the data in the hope that he will stumble upon something. This is the very essence of heuristic learning which can be defined as "learning by finding out for yourself." If a student already has an algorithm for solving a particular problem, he can use it immediately. If he doesn't, he can use heuristic processes to discover one. And if the search becomes too long and unproductive, the teacher can be summoned for help.

This general approach does require a classroom format that permits students to work alone or in small groups. In recent years, a growing number of ABE teachers have shifted toward a more open classroom which

makes room for individualized learning and instruction. Learning centers, of course, are ideally suited to the individual or small group problem solving approach.

As the Pima County curriculum development people point out, the signal need for the proliferation of classrooms using this instructional system is the production of appropriate curriculum materials. More specifically, content models for each ABE curriculum area need to be developed as a framework for the design of problems and data cards. Teachers cannot be expected to generate their own. Most do not have the time and other resources to do that job in addition to their teaching. Most likely, the best source of new materials would be local district or university level curriculum developers in conjunction with commercial publishers. Once an adequate supply of materials is available, teachers can be introduced to the instructional system through workshops, courses and on-site demonstrations.

More research is needed to continue the development of this system and to evaluate its effects in a wide range of content areas and student categories. The evidence is clear from both a management and motivational viewpoint that the system is workable and holds an advantage over more traditional teaching. The cognitive learning effects are less clear and require further study, but even in this respect the informal findings of this study suggest that learning was significant. The ability of a substantial majority of students to progress through all four problem levels in a language they had not yet mastered is a strong indication that the system does indeed foster the mastery of new abstractions through problem solving.

Postscript

The two models developed in the project turn out to be conceptually complementary even though they were not designed with that intention in mind. Whereas the peer instruction system is most effective where recognizable, definable terminal behaviors are involved, the decision making model emphasizes judgmental, constantly varying, non-specifiable terminal behaviors. Whereas the peer instruction model is strongest where the

sequence of skills and actions are relatively fixed, the decision making model focuses on a constantly shifting and weighing of conditions and variables with no "fixed", repeatable action sequence being easily discernible. Thus, they provide the ABE administrator/teacher with two additional strategies for making learning relevant and effective. The instructor must still, however, a) know under what circumstances each would be most appropriate, b) be able, either independently or with the support of the system, to develop or have made available the special materials required for either model. Although we are more than satisfied with the potential effectiveness and usefulness of both models under appropriate conditions, we are still less than satisfied with the dissemination mechanisms by which the ABE community could successfully implement them.

REFERENCES

1. Bialek, H., Taylor, J. and Hauke, R., Instructional Strategies for Training Men of High and Low Aptitude, HumRRO Technical Report 73-10, April, 1973.

2. Weingarten, K., Hungerland, J., and Brennan, M., Development and Implementation of a Quality-Assured, Peer-Instructional Model, HumRRO Technical Report 72-35, November, 1972

APPENDIX A

Community Criteria Checklist

COMMUNITY CRITERIA SHEET

Community _____
Address _____
Referral _____
Contact _____
Phone _____
Contact _____
Phone _____

1. Knowledge/understanding of the model.

| | Yes | No |
|---|---|---|
| Read written description | ( ) | ( ) |
| Described over phone | ( ) | ( ) |
| Face-to-face discussion | ( ) | ( ) |

Is model understood?

| | No ... Quite certain | ? |
|---|---|---|
| a. Role of master, coordinator, HumRRO person | /_____/ | ____ |
| b. Necessity for 100% mastery of each module | /_____/ | ____ |
| c. Major emphasis on performance or doing | /_____/ | ____ |
| d. Subject matter/content locally determined | /_____/ | ____ |
| e. Physical support skills (location, tools, materials, etc.) | /_____/ | ____ |

2. Representativeness of spokesmen

| | Yes | No | ? |
|---|---|---|---|
| a. Elected or appointed by community | ( ) | ( ) | ( ) |
| b. Hired by funding source | ( ) | ( ) | ( ) |
| c. Member of local community | ( ) | ( ) | ( ) |
| d. Can personally make decisions re involvement | ( ) | ( ) | ( ) |

e. Difficult to determine, not clear ( )

3. Identification of an indigenous coordinator

a. No one available or interested

b. Agreement to find one

c. Specific person identified, informed or consented



(continued)

4. Interest areas identified

| Area | Existing program well attended but not succeeding | Existing program not well attended or dropped | No existing program but clear community expressed need | Opinion or impression of spokesman only |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

5. Identification of Interested Student Population

| Area | Vague personal estimate and/or descriptions | Need survey figures available | Actual number known |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Overall estimate of community interest Low / Very high

6. Subjective reaction and comments

Nature of contact
Phone/Letter/Face-to-Face
(Indicate (P) (L) or (F)

Date



(continued)

6. Subjective reaction and comments (continued)

Date _____

Date _____

Date _____

Recommendations

Date _____

Date _____

Date _____

# APPENDIX B

Compton-San Diego Contract

This contract was signed with both Compton and San Diego.

July 25, 1974

LETTER OF AGREEMENT

This letter outlines the obligations of both the Human Resources Research Organization and the Compton Adult School as they cooperatively work together on the peer-instruction implementation segment of HEW Grant No. OEG-0-73-5221 (Improving Adult Education Through Indigenous Peer Instruction and Administrative Development) to the end of calendar year 1974, and through the aforesaid grant's approved extension to continue through calendar year 1975.

The Human Resources Research Organization (HumRRO) agrees to:

1. Commit the services of a full-time experienced staff member to train oe or more site personnel in adapting materials in the area of "survival skills" for use in the peer-instruction special project and organizing and operating the peer-instruction model. This staff member will also provide back-up assistance, guidance and evaluation data during the operational phase of the model.

2. Provide continued and extended coordination between the HumRRO staff person and site personnel on scheduling this training, to make the mutually agreed upon on-site visits in order to complete this training, to cooperatively develop materials and peer-instruction schedules by the end of calendar year 1974, and to provide a concise written chronicle of the entire effort.

3. Share with the Compton Adult School personnel the responsibility to work out classroom adjustments, student scheduling, troubleshooting, and to remain on call when not on-site for any problems that may arise over the project's operational period, calendar year 1974.

4. Make available a peer-instruction back-up staff, a project director and a secretary, for consultation, additional secretarial assistance, professional monitoring of the project, and to produce the final project evaluation and report.

The Compton Adult School agrees to:

1. Commit one or more staff personnel between now and the end of calendar year 1974, as required or up to a third of their time, to make the peer-instruction project a priority assignment. Over this period they will learn the peer-instruction model, design materials on "survival skills" together with the HumRRO staff member, and to make scheduling projections prior to actual implementation.

2. Implement a peer-instruction system in one or more actual classrooms with site students early in calendar year 1975. (Whether this phase will involve special classes using solely peer-instruction as the delivery system, or whether peer-instruction will be phased into on-going classes as a part of the teaching repertoire, remains open.)

3. Grant the HumRRO staff member access to its classrooms and teachers so that optimal situations for introducing peer instruction can be identified, and so that the HumRRO staff member can locate teachers to work with who are flexible and excited about trying out an innovative, experimental approach with all its obstacles and uncertainties.

4. Provide necessary office and clerical support to the project.

5. Commit itself to the research and development nature of the project, understanding the exploratory aspect for implementing peer-instruction in a particular setting and that the aim of this project is to jointly devise procedures and adaptations to best meet the Compton Adult School's needs.

_____ DATE _____

Compton Adult School Representative

_____ DATE _____

HumRRO Project Director

# APPENDIX C

Compton Student Testimonials

COMMENTS ON STUDENT-TEACHER EXPERIENCE

I found the experience of teaching a very beneficial method for learning. Realizing that I had to pass on the knowledge that I had acquired caused me to put forth greater effort to retain and understand. Teaching also served to emphasize the knowledge I had learned; and served as a test to see just how well I had learned. While teaching, I took into consideration just how I had had to learn the information and passed it out to the student as simply as possible.

I found the teaching part as great a benefit to my learning as in being a student.

Respectfully,

Merle Nobles

RECEIVED
MAY 14 1975
COMPTON ADULT CENTER

May 22, 1975

Working in this office as a student and then a Peer Instructor has been the biggest incentive to my starting on a new career.

Classroom learning is practical but actual application is much more profitable. Having to learn a job well enough to be able to teach another student instills in one the value of learning completly - And then teaching that job acts as a review of your knowledge and futher instills that knowledge in you.

Lorraine Sabraw

April 16, 1975

Dear Mr. Polsky:

The "Peer Instruction" was quite an experience to me. This was my first time being put in a position to teach some one what I had just learned. And knowing this when I first started, I tried my best to learn how to do everything correct. Since I was the first student on the C.E.T.A. Program to start at this work station, it was very important for me to learn how to do the work exactly, because every person's knowledge following me depended upon what I showed my student. I really enjoyed being and working with all of you.

Sincerely,

Deborah Funches

# APPENDIX D

## Dissemination Workshop

DISSEMINATION WORKSHOP

Thirty-four (34) participants representing Regions I through VIII attended the HumRRO dissemination workshop held in Aspen, Colorado during the week of July 21 - 25. Twenty-eight (28) participants responded to the End-Of-Workshop questionnaire. Results and comments are presented below.

END OF WORKSHOP EVALUATION

NAME _____

Did the Workshop achieve its objectives? What really matters is (a) whether the participants felt they learned some new skills and techniques, and (b) whether the participants will go back and actually try to disseminate these skill and techniques. The trouble with these "evaluations" is that participants invariably try to make the organizers of the workshops feel good by telling them what they want to hear. What we want to hear are ideas and suggestions about <u>better</u> ways to disseminate the information we presented here.

With that framework in mind, please respond to the following items:

1. (a) Are the Decision-Making and the Peer Instruction techniques relevant to ABE?

| | 5 Particularly Relevant | 4 Somewhat Relevant | 3 Perhaps Relevant | 2 Slightly Relevant | 1 Not At All Relevant |
|---|---|---|---|---|---|
| Decision-Making | 18 | 10 | 0 | 0 | 0 |
| Peer Instruction | 12 | 15 | 1 | 0 | 0 |

(b) If you checked 3, 2 or 1, please explain why.

<u>Comment</u>: Virtually all the participants could see the relevancy of the two techniques to ABE.

2. Did you learn enough about each system to be able to turn around and teach them to others if you wanted to?

| | Definitely | Almost | No |
|---|---|---|---|
| a. Decision-Making | 23 | 5 | 0 |
| b. Peer Instruction | 24 | 4 | 0 |

If you checked "almost" or "no" for either, please state briefly what more you would need if you wanted to disseminate.

a. Decision-Making _____

_____

b. Peer Instruction _____

_____

Comment: It seems that the workshop was successful in transmitting the structure and process of both techniques to the point where most of the participants felt they had been adequately prepared to disseminate them on their own.

3. At this time do you intend to try to get these systems into operation.

| | Definitely | Probably | Not Sure | Probably Not | No |
|---|---|---|---|---|---|
| Decision-Making | 20 | 6 | 2 | 0 | 0 |
| Peer Instruction | 15 | 11 | 2 | 0 | 0 |

Comment: Again, this response is indicative of the success of the workshop in getting across the potential usefulness and disseminability of the two techniques. Whether participants will actually disseminate will be determined by a later follow-up questionnaire.

5. How about the actual work sessions themselves? Could they have been differently organized or presented so as to increase their effectiveness?

| | Yes | No |
|---|---|---|
| Decision-Making | 19 | 8 |
| Peer Instruction | 22 | 5 |

Comment: Clearly, we could have done much better in the way we organized and ran the work sessions. The predominant complaint was that we did not plan a tight enough schedule (we allotted five sessions per technique when, in retrospect, three would have been perfectly adequate). A secondary complaint was that we did not allow participants enough say in how sessions were to be organized and allowing them to have a greater decision-making role in the determination of content. A day into the workshop, we adjusted the schedule in response to the legitimate complaints.

6. How about the implementation manuals? First, could a person <u>without a workshop experience</u> set up a program using the manuals alone?

| | Definitely Could | Probably Could | Not Sure | Probably Not | Definitely Not |
|---|---|---|---|---|---|
| Decision-Making | 1 | 11 | 7 | 7 | 1 |
| Peer Instruction | 0 | 8 | 11 | 7 | 1 |

7. (a) Next, could you use these manuals, after the workshop, to train others in the two systems?

| | Yes | Not Without Revision | No |
|---|---|---|---|
| Decision-Making | 25 | 3 | 0 |
| Peer Instruction | 25 | 3 | 0 |

Comment: We are very interested in whether the manuals can be used as dissemination instruments since we do not envision HumRRO in the role of perpetual disseminators. The results above suggest that, at the present time, the manuals alone (in their present form) would not be able to carry the burden. When augmented by a brief training workshop, they are seen as quite adequate. This suggests the need for some personalized training to accompany distribution of the manual.

All in all, we feel the workshop accomplished its primary goals and that both techniques are conceptually and procedurally strong. The matter of wider dissemination is, however, still a problem and requires further thought and action. One approach is summarized in the voluntary comments of one of the participants:

> "Very often during the sessions it became obvious to me that the Workshop lagged because of becoming bogged down with philosophical, ideological, super-professionalism-type banter which those who've been too long divorced from a classroom situation feel they must perform.
>
> Since I've been a participant in this workshop and have been witness to two diverse reactions, I feel it may prove far more beneficial to Adult students to present following workshops to teachers who can see the advantages more readily than supervisors who will probably never really understand the value of the study simply because they are out of touch with ABE students.*
>
> If the study is to be a success, it appears it must grow from the bottom upwardly."



* emphasis added